Summary of Non-Halibut Catch from the Standardized Stock Assessment Survey Conducted by the International Pacific Halibut Commission in British Columbia from May 28 to August 12, 2008

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SUMMARY OF NON-HALIBUT CATCH FROM THE STANDARDIZED STOCK ASSESSMENT SURVEY CONDUCTED BY THE INTERNATIONAL PACIFIC HALIBUT COMMISSION IN BRITISH COLUMBIA FROM MAY 28 TO AUGUST 12, 2008

by

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Since 2003, a third observer has been deployed on the International Pacific Halibut Commission's (IPHC) Standardized Stock Assessment (SSA) survey in British Columbia, IPHC regulatory area 2B. Similar to the previous surveys, this document summarizes the non-Halibut catch during the 2008 Pacific Halibut (*Hippoglossus stenolepis*) survey and constructs indices of relative abundance for four species of rockfish: Redbanded (*Sebastes babcocki*), Yelloweye (*S. ruberrimus*), Rougheye (*S. aleutianus*), and Quillback (*S. maliger*) over two time periods; 1995 to 2002 and 2003 to 2008. The 1995 to 2002 index of the relative abundance uses a spatially explicit subset of survey data as the configuration of survey grid changed in some of these years. Negative growth rates are noted over this time period of the index. The 2003 to 2008 index of relative abundance uses all survey stations and is based on catch per 100 hooks with all hooks observed. This index from recent survey years shows low growth rates of +6.8%, +4.3%, and -7.2%, for Redbanded, Yelloweye, and Rougheye Rockfishes, respectively. The 2003 to 2008 series growth rate for Quillback Rockfish is +124.3%, but this value may be unduly influenced by two low CPUE values at the beginning of the series in 2003 and 2004. The index of positive catches continues to decrease for all species over both time periods.

RÉSUMÉ

Yamanaka, K.L., Flemming, R.G., Cooke, K., and Dykstra, C., 2011. Summary of non-Halibut catch from the standardized stock assessment survey conducted by the International Pacific Halibut Commission in British Columbia from May 28 to August 12, 2008. Can. Tech. Rep. Fish. Aquat. Sci. 2970: viii + 81 p.

Depuis 2003, un troisième observateur a été affecté à l'étude sur l'évaluation des stocks normalisés de la Commission internationale du flétan du Pacifique (CIFP) en Colombie-Britannique, dans la zone de réglementation 2B de la CIFP. Comme dans le cas des études antérieures, le présent document fournit un résumé des captures de poissons autres que des flétans durant l'étude de 2008 sur le flétan du Pacifique (*Hippoglossus stenolepis*) et établit des indices de l'abondance relative de quatre espèces de sébastes : le sébaste à bandes rouges (*Sebastes babcocki*), le sébaste aux yeux jaunes (*Sebastes ruberrimus*), le sébaste à œil épineux (*Sebastes aleutianus*) et le sébaste à dos épineux (*Sebastes maliger*) durant deux périodes : de 1995 à 2002 et de 2003 à 2008. L'indice d'abondance relative de 1995 à 2002 utilise un sous-ensemble de données d'étude modélisé de manière spatialement explicite étant donné que la configuration de la grille de l'étude a changé pour certaines de ces années. Des taux de croissance négative sont indiqués au cours de cette période de l'indice. L'indice d'abondance relative de 2003 à 2008 utilise toutes les stations de l'étude et est fondé sur la capture sur 100 hameçons, tous les hameçons étant observés. L'indice des années récentes de l'étude montre des taux de croissance de +6,8 %, +4,3 % et -7,2 %, respectivement, pour le sébaste à bandes rouges, le sébaste aux yeux jaunes et le sébaste à œil épineux. Le taux de croissance enregistré pour le sébaste à dos épineux pendant la période allant de 2003 à 2008 est de +124,3 %. Cependant, cette valeur pourrait être faussée par deux faibles valeurs de prise par unité d'effort (PUE) au début de la série de données en 2003 et 2004. Les taux de prises positifs continuent de diminuer pour toutes les espèces au cours des deux périodes de l'étude.

1.0 INTRODUCTION

The International Pacific Halibut Commission's (IPHC) Standardized Stock Assessment (SSA) survey is a fixed-station longline survey that extends from southern Oregon to the Bering Sea. This survey is directed to index Pacific Halibut (*Hippoglossus stenolepis*) abundance and provide accompanying biological samples to assess the Pacific Halibut (Halibut) stock. The British Columbia (regulatory area 2B) portion of this survey has been conducted annually in various configurations since 1963 (www.iphc.washington.edu). Since 2003, the IPHC has provided the opportunity to deploy an additional technician during the survey to identify the catch to species on a hook-by-hook basis and to collect biological samples from rockfish (Yamanaka *et al.* 2004, 2007, and 2008; Lochead *et al.* 2006; Obradovich *et al.* 2008). Between 2003 and 2006, a contractor was hired to conduct this onboard sampling and beginning in 2007 the IPHC was contracted by DFO to provide the third technician for this survey. In addition to Halibut, many other groundfish species are commonly caught on the survey including North Pacific Spiny Dogfish (*Squalus suckleyi*), Sablefish (*Anoplopoma fimbria*), and rockfishes (*Sebastes* spp.).

Similar to past reports, this report summarizes the catch and effort by location and the biological data for the rockfish species caught incidentally during the survey. Catch and effort data collected from the IPHC SSA survey in British Columbia (BC) provide informative coastwide relative abundance indices for many groundfish species.

2.0 METHODS

2.1 IPHC Chartered Vessels and Survey Locations

The *F/V Proud Venture* and *F/V Star Wars* were chartered in 2008 to conduct the Canadian portion (Area 2B) of the IPHC SSA surveys. The *F/V Proud Venture* (CFV/VRN 23197) is a 70-foot steel vessel, skippered by Charles Harper. The *F/V Star Wars II* (CFV/VRN 20492) is an 80-foot wood vessel, skippered by Rob Tournier.

The Canadian portion of the IPHC survey consists of 170 fixed (non-random) survey stations and is divided into four charter regions: 'Vancouver', 'Goose Island', 'St. James', and 'Charlotte'. The 2008 Area 2B and SE Alaska bycatch sampling manual prepared by IPHC (Appendix A) presents maps of these stations in Appendix 3 of that document, "IPHC Stations by DFO Area". Locations of stations fished in 2008 are also plotted (by mean depth) in Figure 1.

2.2 Fishing Gear and Operations

Standardized "conventional" (fixed) longline fishing gear was deployed during the survey and standardized fishing operations followed, as described in the IPHC report of assessment and research activities, 2008 (http://www.iphc.int/publications/rara/2008/2k8rara10a_ssa.pdf). Fishing gear specifications and fishing operations are detailed in Yamanaka *et al.* (2004). For 2008, as in 2007, only five skates per string were deployed. The duration of the fishing event or

'soak time' of the set is calculated as the time elapsed between the last anchor set over the stern and the first anchor hauled aboard (Yamanaka *et al.* 2004). A Sea-Bird Electronics Inc SeaCat 19 water column profiler (temperature, depth, and conductivity) was deployed on all sets. Data are available from the IPHC upon request. Average bottom depths are calculated as the average of the minimum and maximum bottom depths of the set.

2.3 Data Collection

The hook-by-hook observations and biological sampling were conducted as described for the 2003 survey (Yamanaka *et al.* 2004). Appendix A details the biological sampling protocol compiled by the IPHC. For 2008, all rockfish species were sampled. Most rockfish length data was collected on dressed fish (gilled and gutted with gonads intact). Three individuals were measured in a fresh round state (gills and belly intact). The Silvergray Rockfish was excluded from the summary data. Lengths for the two Redbanded Rockfish were converted using conversion factors based on linear regressions fit to all round and dressed fork length data collected in 2004, 2005, and 2006, calculated for Redbanded, Yelloweye and Quillback Rockfishes in Obradovich *et al.* (2008). Similar methods were used in Lochead *et al.* (2006) to calculate conversion factors for Rougheye Rockfish using combined data from 2003 and 2004. The regression equations are reprinted here for convenience (2006 results in square parentheses).

Redbanded:	$l_d = (l_r - 5.4041) / 0.9870$ mm [$(l_r - 0.1637) / 1.0053$]
Yelloweye:	$l_d = (l_r + 5.9226) / 1.0048$ mm [$(l_r + 0.5307) / 0.9986$]
Rougheye:	$l_d = [(l_r - 15.555) / 0.9675$ mm]
Quillback:	$l_d = (l_r - 17.7126) / 0.9400$ mm [$(l_r - 2.4144) / 0.997$]

where l_d = dressed length and l_r = round length

Dressed lengths are generally greater than round lengths for Redbanded, Rougheye, and Quillback Rockfishes, and slightly less than round lengths for Yelloweye Rockfish.

2.4 Catch Rate

Catch rate (U) is defined here as the total number of fish caught (N) divided by the number of normal condition hooks (H) returned from the set, multiplied by 100. The number of fish caught does not include those fish that were identified but escaped before being brought on board (i.e., lost at the roller). The hook count excludes all missing, bent, and broken hooks. Mean species catch rates ($\overline{U}_s$) are calculated as the sum of the non-zero catch rates per set (U_{is}) divided by the number of sets with positive catch (n), where s denotes the species, and i denotes the set.

$$U_{is} = \frac{N_{is}}{H_i} * 100 \qquad \overline{U}_s = \frac{1}{n}\sum_{i=1}^{n}\left(\frac{N_{is}}{H_i} * 100\right) \qquad (3, 4)$$

In previous years (e.g. Yamanaka *et al.* 2008), catch rate was calculated as the catch per intact skate returned from the set, which did not account for differences between the skates, such as missing, bent, and broken hooks.

2.5 Relative Abundance Indices

Relative abundance indices are constructed from the IPHC SSA survey data for two distinct time series of data, one from 1995 to 2002 and the other from 2003 to 2008.

Both of the relative abundance indices are constructed from $\log_2$ transformed non-zero catch rate data. Examining the slope of the regression line running through the median values gives an annual logarithmic growth rate (b), where a slope of 1 and -1 reflect a doubling and halving, respectively, of the catch rate (Schnute *et al.* 2004). Annual relative growth rate (r) is calculated from:

$$r = 2^b - 1 \tag{5}$$

where b is the annual logarithmic growth rate. The accumulated relative change over a series of observations (R) is similarly calculated from:

$$R_l = 2^{b(l-1)} - 1 \tag{6}$$

where b is the annual logarithmic growth rate and l is the number of observations over the time series (Schnute *et al.* 2004).

The spatial distribution of the survey stations has changed over time. In 1995 through to 1997, survey stations were grouped in triangular clusters, while in 1998 to the present, survey stations are positioned equidistant from one another on a 10 nm square grid. Beginning in 1998, regulatory area 2B was divided into four survey regions: 'Vancouver', 'Goose Island', 'St. James', and 'Charlotte'. Surveys were conducted annually in all regions with the exception of 'Vancouver', which was surveyed in 1999 and in years since 2001 (see Figures 1 and 2).

2.5.1. Index from 1995 to 2002

The index from 1995 to 2002 includes only those survey stations that:

1. overlapped with the present grid stations by a radius less than 10 kilometres,
2. were surveyed in all years, and
3. were labelled as having an effective set by the IPHC.

The stations used in the index from the 1995 to 2002 time series are shown in Figure 2.

Species composition data, compiled from the identification of the total catch, is available for 1995 and after 2003, while an estimated species composition is used for 1996 to 2002 (historic IPHC data). For these years with partial species composition data, the catch from the first 20 hooks of each skate in the set was expanded to estimate the total rockfish species composition for the set. Although the entire catch was identified to species during the 1995 survey, 2.78% of the rockfish were recorded as "unidentified rockfish", thus, the catch rate index may be slightly underestimated for these unidentified species.

As in past years, station catch rates (C) for this index of relative abundance are calculated as the total number of fish (N) divided by the number of effective skates (E) in the set.

IPHC defines an effective skate as a skate of 100 circle hooks with 18-foot spacing. Using E standardizes survey data in years when the number of hooks, hook spacing, or hook type varied. Mean species catch rates ($\overline{C}_s$) for each year are estimated from all overlapping stations in the time series for that year (n).

$$C_{is} = \frac{N_{is}}{E_i} \qquad \overline{C}_s = \frac{1}{n}\sum_{i=1}^{n}\frac{N_{is}}{E_i} \qquad (7, 8)$$

From IPHC:

$$E = 1.52\,S\left(1 - e^{-0.006D}\right)\frac{H}{100}A. \qquad (9)$$

where E =number of effective skates;
S = number of skates hauled;
D = hook spacing in feet;
H = number of hooks;
A = adjustment value for differences among hook types.

If the hook spacing is ≤ 4 feet skates are considered ineffective (effective skates = 0). In the years 1996 to 1999, there were fewer "effective skates" than "skates hauled", as skates with less than 100 hooks per skate were deployed in those years. Since 2000, there has been little to no difference between effective skate and skates hauled.

2.5.2. Index from 2003 to 2008

The index of relative abundance from 2003 to 2008 is created using catch rate data from all stations fished during 2003 to 2008. During this period, a third technician collected complete hook by hook catch information, and survey design, gear specifications and fishing operations were consistent. Catch rate is calculated per 100 hooks (equations 3 and 4) for all stations in the survey. Hook counts exclude all missing, bent or broken hooks. This index benefits from the inclusion of data from all stations, accounting for hook problems, and its conceptual simplicity. With more than five years of data this index can be expected to capture trends in relative abundance.

2.6. Index of positive catches

Only a small proportion of the stations fished in this Halibut-directed survey yield a rockfish catch. Since the indices of relative abundance are determined from positive catches, the trends in positive catches over time are also examined. Because this is a spatially explicit survey, positive trends may represent an increasing spatial distribution of rockfish as more of the stations are yielding rockfish. In addition, the frequency of zero catches has also shown to be proportional to abundance in hook and line fisheries (Bannerot and Austin 1983).

3.0 RESULTS AND DISCUSSION

3.1 Survey Locations

The *F/V Proud Venture* fished the 'Vancouver' and 'Goose Island' regions between May 28 and June 28, 2008 and the *F/V Star Wars II* fished the 'St. James' and 'Charlotte' regions between July 15 and August 12, 2008. For set #17, station 2113, no hook tally form is available, although set location and catch sampling information is available. Figure 1 shows survey locations grouped by mean depth of fishing plotted over IPHC survey regions, and Pacific States Marine Fisheries Commission (PSMFC) areas. Details for each set are listed in Appendix B.

3.2 Catch Summary

The DFO "GFBio" database archives data from the 2008 IPHC SSA survey with TRIP_IDs 67357 (*F/V Proud Venture*) and 67358 (*F/V Star Wars II*). The Fisheries Operations System database (FOS) houses landed catch weights under Trip Ids 108107, 108880, 110049 (*F/V Proud Venture*), 111263, 105082, 105639, 106706, and 106901 (*F/V Star Wars II*), readily accessible through the Groundfish Section database front-end "GFFOS".

Species catch, in numbers of fish, is shown in Table 1. North Pacific Spiny Dogfish (Dogfish), Halibut and Sablefish are the three most commonly caught species on the survey, accounting for 75.8% (in numbers) of all species caught. Table 2 lists species that were identified at the surface but escaped before being brought on board, which amount to only a half a percentage of the total catch of marine fish. A total of 32,593 kilograms (kg) of Halibut and 6,861 kg of Rockfish were landed during the survey (Table 3). Yelloweye Rockfish and Redbanded Rockfish account for the 2nd and 3rd greatest landed weights by species, ahead of Sablefish.

3.2.1. Hook by Hook

Thirty nine percent of the hooks deployed on the survey returned empty, 33% of the hooks returned with bait or bait skin, and 28% of the hooks were occupied by a fish or an invertebrate (Table 4). Less than one percent of the hooks were missing, bent or broken. Table 5 lists the total number of hooks deployed in each year from 2003 to 2008, and summarizes line snarls. There were 189 line snarls in 2008, which is less than in previous surveys, but on average more hooks were involved in each. In 2008, 1.3% of the total number of hooks deployed were involved in a snarl.

3.2.2. Biological Sampling

Biological samples were taken for 15 species of rockfish, including 1091, 832, 278, 136, and 86 otolith pairs from Redbanded, Yelloweye, Rougheye, Silvergray, and Quillback rockfishes, respectively (Table 6).

Rockfish length (dressed) summaries by species, for all regions combined, and by PSMFC Area, are shown in Table 7. Area 5C/D had the largest mean size for Yelloweye Rockfish at 58 cm.

Rockfish sexual maturity summaries are shown in Table 8. The majority of rockfish caught during the survey were sexually mature. The sex ratio for Yelloweye Rockfish skewed towards male, with females making up only 42% of the sampled catch. The higher proportion of males is consistent with previous years, when female Yelloweye Rockfish were approximately 37-44% of the catch.

Summary statistics of age data collected in 2008 are presented in Table 9 for Yelloweye Rockfish and Table 10 for Quillback Rockfish, for all areas combined and by PSMFC Areas. Also shown are mean, minima and maxima age by sex for each species. Age frequency histograms for Yelloweye and Quillback Rockfishes, males and females combined, are shown in Figure 3. The age of Yelloweye Rockfish caught ranged from 13 years to 113 years, with a mean of 36 years. The most common age of Yelloweye Rockfish caught on this 2008 IPHC SSA survey was 26 years. The mean age of female Yelloweye Rockfish is 40 years, greater than that for males throughout the survey, at 34 years. Yelloweye Rockfish from area 5C/D had the oldest mean age at 41 years, and area grouping 3C/D,5A had the youngest at 34 years, consistent with the length data. Area 5E had the youngest mean age for males at 31 years. Quillback Rockfish ages ranged from 11 to 70 years with a mean of approximately 35 years. The mean age of female Quillback Rockfish, at 33 years, was lower than the mean age of 37 years for male Quillback Rockfish.

3.3 Catch Rates

Summaries of non-zero rockfish catch rates (numbers of fish per 100 hooks), for the entire BC coast (IPHC area 2B) and separated by PSMFC Areas, are presented in Table 11. Overall mean catch rates were highest for Redbanded and Yelloweye Rockfishes at 3.2 fish per 100 hooks and 2.6 fish per 100 hooks, respectively. The highest mean catch rate for Redbanded Rockfish occurred in area 5E at 5.2 fish per 100 hooks, while for Yelloweye Rockfish the highest rates occurred in area 5B at 4.6 fish per 100 hooks.

Table 11 also shows the proportion of positive catches for each rockfish species. Redbanded and Yelloweye Rockfishes occurred in only 72 and 65 respectively of 169 sets. Quillback Rockfish occur in only 24 sets. Boccaccio, and Canary, Rougheye and Silvergray Rockfishes were encountered on average in less than 14% of the sets. China, Copper, Greenstriped, Rosethorn, Shortraker, and Yellowmouth rockfishes were caught only sporadically, ranging from 1 to 7 positive catches. Darkblotched, Tiger, and Yellowtail Rockfishes were not encountered in 2008.

The spatial distribution of rockfish catch rates (numbers per 100 hooks) of Redbanded, Yelloweye, Rougheye, and Quillback Rockfishes, four commonly caught species, are shown in Figures 4 through 7. Redbanded, Yelloweye, and Quillback Rockfishes were caught throughout the entire survey area, while Rougheye Rockfish was caught only in northern areas, primarily north of Haida Gwaii. The distributions of these catch rates are clearly related to mean fishing depth.

3.4 Relative abundance indices

Figures 8 through 12 present the abundance indices for the four commonly caught rockfish species. Boxplots of the $\log_2$ transformed median non-zero catch per unit effort for the time series are shown in the upper panels and a series median and growth rate are listed. The lower panels of each show a plot of the proportion of positive catches with a regression line for the index shown and the average annual change listed.

3.4.1. Index from 1995 to 2002

The Index from 1995 to 2002, which uses effective skates as unit effort, employs catch rate data from overlapping survey stations that were fished in all years between 1995 and 2002. The mean number of stations included in this analysis is 79, ranging from 69 stations in 1998 to 92 stations in 1997 (see Figure 2 for station locations and Table 12).

Figure 8 is divided into 4 quarters showing Redbanded Rockfish in the upper left, Yelloweye Rockfish in the upper right, Rougheye Rockfish in the lower left, and Quillback Rockfish in the lower right quarter. The slope of the regression line through the annual median values shows a declining trend for these rockfishes. For the 1995 to 2002 time series index (with effective skate as the unit of effort), the accumulated relative change over the first 8 years of the survey is -81.2%, -78.7%, -74.3%, and -42.8% for Redbanded, Yelloweye, Rougheye and Quillback Rockfishes, respectively (Figure 8).

3.4.2. Index from 2003 to 2008

The Index from 2003 to 2008 employs all 170 stations fished each year between 2003 and 2008, with the exception of one station in 2008 for which hook tally data was lost overboard. This latest index uses 100 hooks as a unit of effort (Table 13). Relative abundance indices for each of the four rockfish species; Redbanded, Yelloweye, Rougheye and Quillback, respectively are presented in Figures 9 through 12, respectively.

For the 2003 to 2008 time series index (with 100 hooks as the unit of effort) the change in CPUE from year to year is nearly zero, except in the case of Quillback Rockfish which actually shows an increase in CPUE. The series growth rate in the last six years of the survey is +6.8%, +4.3%, -7.2%, for Redbanded, Yelloweye, and Rougheye Rockfishes, respectively (Figure 9, 10, and 11). The series growth rate for Quillback Rockfish is +124.3%, but this value may be unduly influenced by two low CPUE values at the beginning of the series in 2003 and 2004 (Figure 12).

R^2 values are higher for the earlier 1995 to 2002 CPUE series, although not a significant departure from 0, than the latter series from 2003 to 2008.

3.5 Index of positive catches

The positive catch rate from overlapping stations in the earlier years of 1995 to 2002 ranged from a high of 56% of stations for Redbanded Rockfish in 1996 to a low of

approximately 3% of stations for Quillback Rockfish in 2001 (Table 12). Similar proportions of stations with zero catch were seen in the data from all stations in 2003 to 2008, with the highest positive catch rate of 45% for Redbanded Rockfish in 2005 to the lowest of 11% for Rougheye Rockfish in 2006 and 2007 (Table 13).

The proportion of positive catches over time shows a declining trend for all species. Over the 1995 to 2002 series, the average annual change in the rate of positive catches is -1.90, -1.39, -1.29, and -0.20 for Redbanded, Yelloweye, Quillback, and Rougheye Rockfishes, respectively. The rate of positive catches continues to decrease over the 2003 to 2008 time series, with an average annual change of -0.38, -1.25, -0.48, and -0.44 for Redbanded, Yelloweye, Rougheye and Quillback Rockfishes, respectively.

SUMMARY

While the 1995 – 2002 index shows a general decline in the relative abundance of Redbanded, Yelloweye, Rougheye, and Quillback Rockfishes over 8 years, the more recent 2003 – 2008 index may indicate a reversal or at least a halt to this trend. Comparison between the two time series is problematic given differences in the number of stations sampled, the sampling for species other than Halibut and the lack of overlap in the time series. The later index (2003 – 2008) includes a total count of species at all survey stations and accounts for hook problems, hence, over time, may be a more reliable index for species other than Halibut. The continuing decrease in the rate of positive catches from this fixed station survey may be an indication of the abundance trends of these rockfish species by area, suggesting an overall depletion.

The IPHC SSA Halibut survey provides valuable, fishery independent relative abundance indices for commonly caught rockfish. There is no other coastwide, long-term abundance index available for fish species vulnerable to longline gear. This survey may also provide indices of relative abundance for other commonly caught species, such as Dogfish and Sablefish, and rate of positive catch trends for other less commonly caught species.

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Table 1. Summary of species catch brought on board in numbers (descending order) and as a percent of total marine fish species for the BC coast, and in numbers by each PSMFC Area. Rockfish are highlighted.

Common Name	Taxonomic Name	Total	3C/D, 5A	5B	5C/D	5E	% Total
North Pacific Spiny Dogfish	*Squalus suckleyi*	8854	5038	1973	1728	115	38.00
Pacific Halibut	*Hippoglossus stenolepis*	6836	1770	2071	2507	488	29.34
Sablefish	*Anoplopoma fimbria*	2356	341	948	801	266	10.11
Redbanded Rockfish	*Sebastes babcocki*	1137	86	412	589	50	4.88
Arrowtooth Flounder	*Reinhardtius stomias*	1108	208	318	568	14	4.76
Yelloweye Rockfish	*Sebastes ruberrimus*	830	170	404	165	91	3.56
Longnose Skate	*Raja rhina*	781	252	223	274	32	3.35
Lingcod	*Ophiodon elongatus*	411	233	60	73	45	1.76
Rougheye Rockfish	*Sebastes aleutianus*	276	3	68	84	121	1.18
Starfish	*Asteroidea*	269	23	15	224	7	-
Silvergray Rockfish	*Sebastes brevispinis*	137	14	23	46	54	0.59
Sunflower Starfish	*Pycnopodia helianthoides*	116	83	23	4	6	-
Big Skate	*Raja binoculata*	95	26	5	54	10	0.41
Shortspine Thornyhead	*Sebastolobus alascanus*	90		16	60	14	0.39
Quillback Rockfish	*Sebastes maliger*	88	33	10	28	17	0.38
Pacific Cod	*Gadus macrocephalus*	56	3	1	51	1	0.24
Spotted Ratfish	*Hydrolagus colliei*	46	14	4	16	12	0.20
Canary Rockfish	*Sebastes pinniger*	39	10	9	7	13	0.17
Bocaccio	*Sebastes paucispinis*	31	14	10	3	4	0.13
Aleutian Skate	*Bathyraja aleutica*	19		2	16	1	0.08
Striped Sun Starfish	*Solaster stimpsoni*	19	19				-
Thornyheads	*Sebastolobinae*	17	4	13			0.07
Shortraker Rockfish	*Sebastes borealis*	16	2	1	6	7	0.07
Anemone	Actiniaria	14		1	10	3	-
Petrale Sole	*Eopsetta jordani*	14	5		6	3	0.06
Tope Shark	*Galeorhinus galeus*	11	9		2		0.05
Radiata	Radiata	11		1	10		-
Anthozoa	Anthozoa	10		1	3	6	-
Sea Urchins	Echinacea	9		4	2	3	-
Sponges	Porifera	9		8	1		-
China Rockfish	*Sebastes nebulosus*	9	5			4	0.04
Inanimate Object(S)	Inanimate object(s)	8	4	2	2		-
Octopus	Octopoda	8	4		4		-
Sea Cucumbers	Holothuroidea	7	5	1		1	-
Copper Rockfish	*Sebastes caurinus*	6			6		0.03
Yellowmouth Rockfish	*Sebastes reedi*	6	2	4			0.03
Pacific Sleeper Shark	*Somniosus pacificus*	5		3	2		0.02
Walleye Pollock	*Theragra chalcogramma*	5			5		0.02
Wolf Eel	*Anarrhichthys ocellatus*	3	3				0.01
Skates	Rajidae	3	1	1	1		0.01
Rosethorn Rockfish	*Sebastes helvomaculatus*	3	1		1	1	0.01
Sea Whip	*Balticina septentrionalis*	2			2		-
Bluntnose Sixgill Shark	*Hexanchus griseus*	2	2				0.01
Paragorgia Pacifica	*Paragorgia pacifica*	2	1	1			-
Phrynophiurida	Phrynophiurida	2		2			-
Jellyfish	Scyphozoa	2			2		-
Greenstriped Rockfish	*Sebastes elongatus*	2	1			1	0.01
Unidentified Shark	Unidentified shark	2			2		0.01
Ascidians And Tunicates	Ascidiacea	1			1		-
Dungeness Crab	*Cancer magister*	1			1		-
Pacific Sanddab	*Citharichthys sordidus*	1	1				0.00
Giant Wrymouth	*Cryptacanthodes giganteus*	1			1		0.00
Hagfishes	Myxinidae	1			1		0.00
Coho Salmon	*Oncorhynchus kisutch*	1				1	0.00
Bubble Gum Coral	*Paragorgia arborea*	1	1				-
Scallop	Pectinidae	1	1				-
Sea Pens	Pennatulacea	1	1				-
Blue Shark	*Prionace glauca*	1				1	0.00
Marine Fish Only		**23299**	**8251**	**6579**	**7103**	**1366**	**100**
Total Catch		**23792**	**8393**	**6638**	**7369**	**1392**	

Nb: This table includes second species caught on the same hook, and thus reports higher catch than table 3.

Table 2. Summary of species catch identified but escaped before being brought on board ("lost at the roller") in numbers (descending order) and as a percent of total marine fish species for the BC coast and in numbers by each PSMFC Area.

Common Name	Taxonomic Name	Total	3C/D, 5A	5B	5C/D	5E	% Total Marine Fish Catch
Pacific Halibut	*Hippoglossus stenolepis*	65	21	16	23	5	0.28
Redbanded Rockfish	*Sebastes babcocki*	18	1	11	6		0.08
Yelloweye Rockfish	*Sebastes ruberrimus*	8	2	3		3	0.03
Sablefish	*Anoplopoma fimbria*	4	1	1		2	0.02
Rougheye Rockfish	*Sebastes aleutianus*	3				3	0.01
Silvergray Rockfish	*Sebastes brevispinis*	3		3			0.01
Shortraker Rockfish	*Sebastes borealis*	2			1	1	0.01
Shortspine Thornyhead	*Sebastolobus alascanus*	2			2		0.01
Arrowtooth Flounder	*Reinhardtius stomias*	1			1		0.00
Bocaccio	*Sebastes paucispinis*	1		1			0.00
Marine Fish Only		**107**	**25**	**35**	**33**	**14**	**0.46**
Total Lost At The Roller		**107**	**25**	**35**	**33**	**14**	

Table 3. Total landed weight (kg) by species for the BC stations in the 2008 IPHC survey. Weights are for fresh, round fish, converted automatically and provided by the Groundfish Section front-end to the Fisheries Operating System database (GFFOS).

Species	Kilograms
Pacific Halibut	32,593
Yelloweye Rockfish	2,798
Redbanded Rockfish	2,769
Sablefish	2,282
Rougheye Rockfish	609
Silvergray Rockfish	295
Shortspine Thornyhead	167
Bocaccio	114
Quillback Rockfish	113
Pacific Cod	91
Canary Rockfish	77
Shortraker Rockfish	56
China Rockfish	9
Copper Rockfish	8
Yellowmouth Rockfish	8
Rosethorn Rockfish	3
Greenstriped Rockfish	2
ALL ROCKFISH	6,861

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Spotted Ratfish	*Hydrolagus colliei*	46	14	4	16	12	0.20
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Anemone	Actiniaria	14		1	10	3	-
Petrale Sole	*Eopsetta jordani*	14	5		6	3	0.06
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Radiata	Radiata	11		1	10		-
Anthozoa	Anthozoa	10		1	3	6	-
Sea Urchins	Echinacea	9		4	2	3	-
Sponges	Porifera	9		8	1		-
China Rockfish	*Sebastes nebulosus*	9	5			4	0.04
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Sea Cucumbers	Holothuroidea	7	5	1		1	-
Copper Rockfish	*Sebastes caurinus*	6			6		0.03
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Pacific Sleeper Shark	*Somniosus pacificus*	5		3	2		0.02
Walleye Pollock	*Theragra chalcogramma*	5			5		0.02
Wolf Eel	*Anarrhichthys ocellatus*	3	3				0.01
Skates	Rajidae	3	1	1	1		0.01
Rosethorn Rockfish	*Sebastes helvomaculatus*	3	1		1	1	0.01
Sea Whip	*Balticina septentrionalis*	2			2		-
Bluntnose Sixgill Shark	*Hexanchus griseus*	2	2				0.01
Paragorgia Pacifica	*Paragorgia pacifica*	2	1	1			-
Phrynophiurida	Phrynophiurida	2		2			-
Jellyfish	Scyphozoa	2			2		-
Greenstriped Rockfish	*Sebastes elongatus*	2	1			1	0.01
Unidentified Shark	Unidentified shark	2			2		0.01
Ascidians And Tunicates	Ascidiacea	1			1		-
Dungeness Crab	*Cancer magister*	1			1		-
Pacific Sanddab	*Citharichthys sordidus*	1	1				0.00
Giant Wrymouth	*Cryptacanthodes giganteus*	1			1		0.00
Hagfishes	Myxinidae	1			1		0.00
Coho Salmon	*Oncorhynchus kisutch*	1				1	0.00
Bubble Gum Coral	*Paragorgia arborea*	1	1				-
Scallop	Pectinidae	1	1				-
Sea Pens	Pennatulacea	1	1				-
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Sablefish	*Anoplopoma fimbria*	4	1	1		2	0.02
Rougheye Rockfish	*Sebastes aleutianus*	3				3	0.01
Silvergray Rockfish	*Sebastes brevispinis*	3		3			0.01
Shortraker Rockfish	*Sebastes borealis*	2			1	1	0.01
Shortspine Thornyhead	*Sebastolobus alascanus*	2			2		0.01
Arrowtooth Flounder	*Reinhardtius stomias*	1			1		0.00
Bocaccio	*Sebastes paucispinis*	1		1			0.00
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Shortraker Rockfish	56
China Rockfish	9
Copper Rockfish	8
Yellowmouth Rockfish	8
Rosethorn Rockfish	3
Greenstriped Rockfish	2
ALL ROCKFISH	6,861

Table 4. Summary of hook observations by description, DFO GFBio database code, number of hooks retrieved, and percent of total hooks.

HOOK YIELD

Description	GFBio Code	# hooks	% of total
Unknown	0	239	0.29
Empty hook	1	32462	38.79
Bait on hook	2	18235	21.79
Animal or inanimate object on hook	3	23623	28.23
Species head on hook	4	126	0.15
Species dropped off hook	5	107	0.13
Bait skin on hook	6	8903	10.64
Hook not observed	7	0	0.00
Total		**83695**	**100.00**

HOOK CONDITION

Description	GFBio Code	# hooks	% of total
Unknown	0	239	0.29
Broken at rail	4	0	0.00
Hook condition not observed	5	0	0.00
Normal	6	82770	98.89
Missing, bent, or broken hook	7	686	0.82
Total		**83695**	**100.00**

LINE CONDITION

Description	GFBio Code	# hooks	% of total
Normal	1	82361	98.41
Snarl in line	2	1107	1.32
Line not observed	3	0	0.00
Gear parted	4	18	0.02
Gear lost	5	209	0.25
Total		**83695**	**100.00**

NB: Table counts do not include second animals/inanimate objects caught on the same hook.

Table 5. Number of hooks deployed and summary of line snarls, including the total number and percentage of hooks involved in snarls each year, for 2003 to 2008 data.

YEAR	Number of Hooks Deployed	Total Number of Snarls	Number of Hooks Per Snarl				Total Number of Hooks Involved	% hooks involved
			Average	Minimum	Maximum	Standard Deviation		
2003	134,956	294	1.44	1	15	1.59	423	0.31
2004	135,288	547	3.13	1	57	4.22	1711	1.26
2005	118,997	426	3.03	1	111	6.09	1291	1.09
2006	101,273	281	4.05	1	72	6.54	1139	1.12
2007	84,231	243	4.24	1	66	6.52	1030	1.22
2008	83,695	189	5.86	1	45	7.91	1107	1.32

Table 6. Number of specimens, by species, measured for length, examined for sex and maturity state, and with otoliths removed for ageing.

Species	Lengths	Sex	Maturities	Otoliths
Redbanded Rockfish	1130	1121	1111	1091
Yelloweye Rockfish	832	820	809	832
Rougheye Rockfish	277	277	276	278
Silvergray Rockfish	136	134	133	136
Quillback Rockfish	86	83	83	86
Canary Rockfish	43	42	41	43
Bocaccio	31	31	31	31
Shortraker Rockfish	16	15	15	16
China Rockfish	9	9	9	9
Copper Rockfish	6	6	6	6
Yellowmouth Rockfish	6	6	6	6
Rosethorn Rockfish	3	3	3	3
Greenstriped Rockfish	2	2	2	2
All rockfish	**2577**	**2549**	**2525**	**2539**

Table 7. Summary of dressed rockfish fork length (cm) of all rockfishes for entire BC coast (IPHC area 2B) and by PSMFC Area.

	Bocaccio					Canary Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	68	66	68	71	72	48	46	51	51	48
Standard Error	0.94	1.31	1.78	1.00	2.78	0.83	1.86	1.45	0.85	1.42
Median	68	65	68	70	70	49	46	50	51	49
Mode	73	63,65,73	67,68	70	>3 values	51	37,46	49,51,57	51	42,46,50
Standard Dev	5.22	4.91	5.64	1.73	5.56	5.47	6.71	4.36	2.42	5.11
Sample Variance	27.23	24.11	31.82	3.00	30.92	29.88	45.09	19.03	5.84	26.06
Minimum	58	59	58	70	68	37	37	43	47	39
Maximum	80	74	80	73	80	57	57	57	55	55
Range	22	15	22	3	12	20	20	14	8	16
Count	31	14	10	3	4	43	13	9	8	13

	China Rockfish					Copper Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	35	36	34	-	-	42	42	-	-	-
Standard Error	0.71	0.93	0.85	-	-	1.45	1.45	-	-	-
Median	36	37	35	-	-	42	42	-	-	-
Mode	36,38	38	>3 values	-	-	42	42	-	-	-
Standard Dev	2.13	2.07	1.71	-	-	3.54	3.54	-	-	-
Sample Variance	4.53	4.30	2.92	-	-	12.57	12.57	-	-	-
Minimum	32	33	32	-	-	37	37	-	-	-
Maximum	38	38	36	-	-	47	47	-	-	-
Range	6	5	4	-	-	10	10	-	-	-
Count	9	5	4	-	-	6	6	-	-	-

	Greenstriped Rockfish					Quillback Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	33	34	31	-	-	40	41	42	40	39
Standard Error	1.50	-	-	-	-	0.33	0.45	1.08	0.65	0.67
Median	33	34	31	-	-	40	41	41	41	38
Mode	31,34	34	31	-	-	39	39	39	40	35,37,38
Standard Dev	2.12	-	-	-	-	3.06	2.59	3.24	3.39	2.75
Sample Variance	4.50	-	-	-	-	9.36	6.71	10.50	11.52	7.57
Minimum	31	34	31	-	-	31	34	39	31	35
Maximum	34	34	31	-	-	49	46	49	46	44
Range	3	0	0	-	-	18	12	10	15	9
Count	2	1	1	-	-	86	33	9	27	17

	Redbanded Rockfish					Rosethorn Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	51	48	51	51	48	31	30	34	29	-
Standard Error	0.16	0.57	0.29	0.19	0.86	1.53	-	-	-	-
Median	51	48	51	52	48	30	30	34	29	-
Mode	52	46	50,54	52	48	29,30,34	30	34	29	-
Standard Dev	5.25	5.24	5.78	4.62	5.91	2.65	-	-	-	-
Sample Variance	27.61	27.48	33.45	21.34	34.91	7.00	-	-	-	-
Minimum	33	33	34	35	37	29	30	34	29	-
Maximum	66	61	66	65	60	34	30	34	29	-
Range	33	28	32	30	23	5	0	0	0	-
Count	1128	85	407	589	47	3	1	1	1	-

Table 7 continued on next page

Table 7 continued

	Rougheye Rockfish					Shortraker Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	51	51	51	52	50	68	64	58	75	65
Standard Error	0.32	1.45	0.63	0.65	0.41	2.57	5.00	-	5.80	2.72
Median	50	51	50	52	50	68	64	58	69	66
Mode	51	49,51,54	49	47	51	68	59,69	58	68	68
Standard Dev	5.24	2.52	5.21	5.97	4.54	10.29	7.07	-	12.96	7.70
Sample Variance	27.49	6.33	27.11	35.64	20.64	105.87	50.00	-	168.00	59.27
Minimum	41	49	42	41	41	55	59	58	68	55
Maximum	69	54	65	65	69	98	69	58	98	79
Range	28	5	23	24	28	43	10	0	30	24
Count	277	3	68	85	121	16	2	1	5	8

	Silvergray Rockfish					Yelloweye Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	55	56	53	57	55	56	55	55	58	57
Standard Error	0.36	0.92	0.72	0.53	0.65	0.22	0.44	0.31	0.49	0.77
Median	55	54	53	57	56	56	55	55	58	59
Mode	55	53,54,59	52,54	57	54	53	58	53	61	63
Standard Dev	4.18	3.31	3.44	3.53	4.79	6.42	5.73	6.24	6.28	7.51
Sample Variance	17.46	10.92	11.81	12.43	22.97	41.22	32.88	38.90	39.40	56.44
Minimum	40	52	46	50	40	33	39	33	45	37
Maximum	70	63	60	70	65	77	75	77	74	70
Range	30	11	14	20	25	44	36	44	29	33
Count	135	13	23	45	54	830	169	404	163	94

	Yellowmouth Rockfish				
	All Areas	3C/D, 5A	5B	5C/D	5E
Mean	41	45	39	-	-
Standard Error	3.54	1.00	5.25	-	-
Median	44	45	43	-	-
Mode	>3 values	44,46	>3 values	-	-
Standard Dev	8.68	1.41	10.50	-	-
Sample Variance	75.37	2.00	110.25	-	-
Minimum	24	44	24	-	-
Maximum	48	46	48	-	-
Range	2	2	24	-	-
Count	6	2	4	-	-

Table 8. Sexual maturity, assessed visually, for male and female rockfish species showing the number (proportion) of fish in each maturity stage and the total number of fish sampled.

MALE	Proportion of Individuals in Each Maturity Stage							Total
ROCKFISH	Immature	Maturing	Developing	Developed	Running	Spent	Resting	N
Bocaccio			0.25	0.71			0.04	24
Canary		0.19	0.13	0.69				16
China						1.00		3
Copper		0.50	0.50					4
Greenstriped								0
Quillback		0.05	0.49	0.19		0.11	0.16	37
Redbanded		0.02	0.17	0.69		0.08	0.04	476
Rosethorn			0.50	0.50				2
Rougheye	0.01	0.07	0.12	0.76		0.01	0.03	138
Shortraker		0.13	0.13	0.63			0.13	8
Silvergray	0.01	0.05	0.48	0.17		0.08	0.22	88
Yelloweye	0.01	0.09	0.29	0.03		0.51	0.07	470
Yellowmouth			0.75				0.25	4
All Rockfish	0.01	0.05	0.24	0.40		0.23	0.07	1270

FEMALE	Proportion of Individuals in Each Maturity Stage							Total
ROCKFISH	Immature	Maturing	Mature	Fertilized	Larvae	Spent	Resting	N
Bocaccio		0.14	0.43				0.43	7
Canary		0.40	0.52				0.08	25
China							1.00	6
Copper			0.50				0.50	2
Greenstriped		0.50			0.50			2
Quillback		0.04	0.17		0.02	0.04	0.72	46
Redbanded	0.00	0.05	0.08	0.01	0.01	0.20	0.64	635
Rosethorn					1.00			1
Rougheye	0.01	0.31	0.09	0.04		0.07	0.48	138
Shortraker		0.14	0.43				0.43	7
Silvergray		0.04	0.07	0.02	0.02	0.07	0.78	45
Yelloweye	0.01	0.09	0.09	0.04	0.10	0.15	0.53	339
Yellowmouth							1.00	2
All Rockfish	0.00	0.10	0.10	0.02	0.04	0.15	0.59	1255

Table 9. Summary statistics by PSMFC Area groupings for Yelloweye Rockfish age data collected on the IPHC 2008 SSA Survey.

Male and Female Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	36.2	34.1	35.3	41.0	35.0
Standard Error	0.59	1.23	0.85	1.48	1.38
Median	29.0	28.0	28.0	33.0	33.5
Mode	26	25	27	25	26
Standard Deviation	16.88	15.77	16.86	18.95	13.20
Sample Variance	284.80	248.63	284.26	359.25	174.24
Minimum	13	13	15	17	15
Maximum	113	98	113	105	80
Count	816	164	397	163	92

Male Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	33.5	32.0	33.9	35.8	30.9
Minimum	13	13	15	17	18
Maximum	102	73	102	85	48
Count	472	112	250	71	39

Female Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	39.9	38.7	37.7	45.1	38.0
Minimum	15	15	15	18	15
Maximum	113	98	113	105	80
Count	344	52	147	92	53

Table 10. Summary statistics by PSMFC Area groupings for Quillback Rockfish age data collected on the IPHC 2008 SSA Survey.

Male and Female Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	34.5	32.1	37.8	33.7	38.2
Standard Error	1.34	2.23	3.27	2.50	2.86
Median	33.0	28.0	33.0	30.0	38.0
Mode	28	26	33	24	39
Standard Deviation	12.20	12.19	9.81	12.98	11.78
Sample Variance	148.89	148.55	96.19	168.60	138.69
Minimum	11	13	28	11	14
Maximum	70	65	59	70	58
Count	83	30	9	27	17

Male Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	36.7	35.7	45.3	34.1	39.8
Minimum	13	13	33	23	14
Maximum	65	65	59	57	52
Count	37	15	4	13	5

Female Ages (years)	ALL AREAS	3C/D, 5A	5B	5C/D	5E
Mean	32.7	28.5	31.8	33.4	37.6
Minimum	11	20	28	11	19
Maximum	70	42	35	70	58
Count	46	15	5	14	12

Table 11. Summary of rockfish catch rate (numbers of fish per 100 hooks, non-zero catches) for entire BC coast (IPHC area 2B) and by PSMFC Area grouping.

All Areas (169 sets)	Bocaccio	Canary	China	Copper	Green-striped	Quillback	Red-banded	Rosethorn	Rougheye	Shortraker	Silvergray	Yelloweye	Yellow-mouth
Mean	0.369	0.438	0.905	1.220	0.200	0.743	3.223	0.197	2.355	0.463	0.847	2.606	0.242
Median	0.200	0.400	0.905	1.220	0.200	0.605	1.730	0.200	0.910	0.200	0.200	1.020	0.200
Standard Deviation	0.297	0.258	0.163		0.000	0.576	3.848	0.006	3.360	0.479	1.364	3.819	0.094
Sample Variance	0.088	0.066	0.026		0.000	0.332	14.804	0.000	11.289	0.230	1.861	14.585	0.009
Minimum	0.190	0.200	0.790	1.220	0.200	0.190	0.200	0.190	0.190	0.200	0.190	0.190	0.200
Maximum	1.250	1.020	1.020	1.220	0.200	2.030	23.090	0.200	13.450	1.410	6.270	18.580	0.410
Positive Catch Rate	0.101	0.107	0.012	0.006	0.012	0.142	0.426	0.018	0.142	0.041	0.195	0.385	0.030
3C/D, 5A (54 Sets)													
Mean	0.353	0.400	1.020		0.200	0.741	1.460	0.200	0.600	0.200	0.312	1.565	0.200
Median	0.200	0.400	1.020		0.200	0.800	0.300	0.200	0.600	0.200	0.200	0.810	0.200
Standard Deviation	0.241	0.200				0.380	2.756			0.000	0.274	1.973	0.000
Sample Variance	0.058	0.040				0.145	7.593			0.000	0.075	3.892	0.000
Minimum	0.190	0.200	1.020		0.200	0.200	0.200	0.200	0.600	0.200	0.190	0.190	0.200
Maximum	0.820	0.600	1.020		0.200	1.220	9.810	0.200	0.600	0.200	1.020	7.300	0.200
Positive Catch Rate	0.148	0.093	0.019	0.000	0.019	0.167	0.222	0.019	0.019	0.037	0.167	0.407	0.037
5B (43 Sets)													
Mean	0.513	0.257				1.010	3.216		1.381	0.200	0.584	4.592	0.270
Median	0.300	0.200				1.010	2.125		0.400	0.200	0.410	1.720	0.200
Standard Deviation	0.501	0.151				0.580	4.618		1.732		0.524	5.943	0.121
Sample Variance	0.251	0.023				0.336	21.328		2.998		0.274	35.314	0.015
Minimum	0.200	0.200				0.600	0.200		0.190	0.200	0.200	0.200	0.200
Maximum	1.250	0.600				1.420	23.090		4.910	0.200	1.820	18.580	0.410
Positive Catch Rate	0.093	0.163	0.000	0.000	0.000	0.047	0.605	0.000	0.233	0.023	0.186	0.419	0.070
5C/D (62 Sets)													
Mean	0.200	0.710		1.220		0.514	3.769	0.190	1.723	0.410	0.847	1.676	
Median	0.200	0.710		1.220		0.200	2.640	0.190	0.805	0.200	0.200	0.605	
Standard Deviation	0.000	0.438				0.578	3.371		2.516	0.364	1.826	2.331	
Sample Variance	0.000	0.192				0.334	11.362		6.330	0.132	3.334	5.433	
Minimum	0.200	0.400		1.220		0.190	0.200	0.190	0.200	0.200	0.200	0.200	
Maximum	0.200	1.020		1.220		2.030	14.340	0.190	8.380	0.830	6.270	8.960	
Positive Catch Rate	0.048	0.032	0.000	0.016	0.000	0.177	0.516	0.016	0.161	0.048	0.177	0.323	0.000
5E (10 Sets)													
Mean	0.405	0.668	0.790		0.200	1.750	5.145	0.200	8.290	1.410	2.230	3.762	
Median	0.405	0.615	0.790		0.200	1.750	5.145	0.200	8.310	1.410	2.300	2.780	
Standard Deviation	0.290	0.122				0.226	5.282		5.170		1.658	2.707	
Sample Variance	0.084	0.015				0.051	27.900		26.729		2.747	7.326	
Minimum	0.200	0.590	0.790		0.200	1.590	1.410	0.200	3.110	1.410	0.410	1.220	
Maximum	0.610	0.850	0.790		0.200	1.910	8.880	0.200	13.450	1.410	4.700	8.260	
Positive Catch Rate	0.200	0.400	0.100	0.000	0.100	0.200	0.200	0.100	0.300	0.100	0.500	0.500	0.000

Table 12. Catch data summary for Quillback, Yelloweye, Redbanded and Rougheye Rockfishes caught on the IPHC SSA survey from 1995 to 2002, for overlapping stations effectively fished in all years. For each year, the number of stations fished, the positive catch rate, and the $\log_2$ median catch rates (#fish/effective skate) of the non-zero catches are reported.

		Redbanded Rockfish		Yelloweye Rockfish		Rougheye Rockfish		Quillback Rockfish	
Year	# Stations fished	Positive Catch Rate	log2(Median)	Positive Catch Rate	log2(Median)	Positive Catch Rate	log2(Median)	Positive Catch Rate	log2(Median)
1995	84	40.5	1.993	28.6	2.138	9.5	0.132	10.7	-1.322
1996	86	55.8	1.086	38.4	1.281	11.6	1.270	15.1	-0.719
1997	92	33.7	-0.356	33.7	-0.017	6.5	-0.529	6.5	-1.356
1998	69	49.3	-0.415	31.9	-0.576	7.2	-1.701	5.8	-0.918
1999	76	46.1	-0.134	32.9	-1.152	10.5	-1.143	5.3	-1.719
2000	72	40.3	-0.228	27.8	-0.102	12.5	-1.813	6.9	-1.813
2001	75	40.0	-0.174	26.7	0.126	8.0	-0.735	2.7	-0.813
2002	75	26.7	-1.335	22.7	-0.742	6.7	-1.327	4.0	-2.327

Table 13. Catch data summary for Quillback, Yelloweye, Redbanded and Rougheye Rockfishes caught on the IPHC SSA survey from 2003 to 2008, for all stations fished. For each year, the number of stations fished, the total number of hooks fished, the number of fish caught, the positive catch rate, and the $\log_2$ median catch rates (#fish/100 hooks) of the non-zero catches are reported.

			Redbanded Rockfish			Yelloweye Rockfish			Rougheye Rockfish			Quillback Rockfish		
Year	# Stations with data	# Hooks	Number Caught	Positive Catch Rate	log2(Median)	Number Caught	Positive Catch Rate	log2(Median)	Number Caught	Positive Catch Rate	log2(Median)	Number Caught	Positive Catch Rate	log2(Median)
2003	170	134,868	1,295	41.8	0.333	1210	41.8	-0.184	286	12.9	-1.184	154	17.6	-1.396
2004	170	133,212	1,972	43.5	0.978	1522	40.6	0.595	458	17.1	-0.168	138	13.5	-2.000
2005	170	117,947	1,568	44.7	1.000	1168	40.6	0.506	536	15.9	-0.811	295	15.3	-0.234
2006	170	100,423	1,270	41.2	0.824	995	38.2	0.043	215	10.6	-0.234	195	17.1	-0.578
2007	170	83,637	724	38.8	0.491	688	32.4	0.536	117	11.2	-2.252	121	13.5	-0.304
2008	169	82,770	1,137	42.6	0.795	830	38.5	0.029	276	14.2	-0.128	88	14.2	-0.713

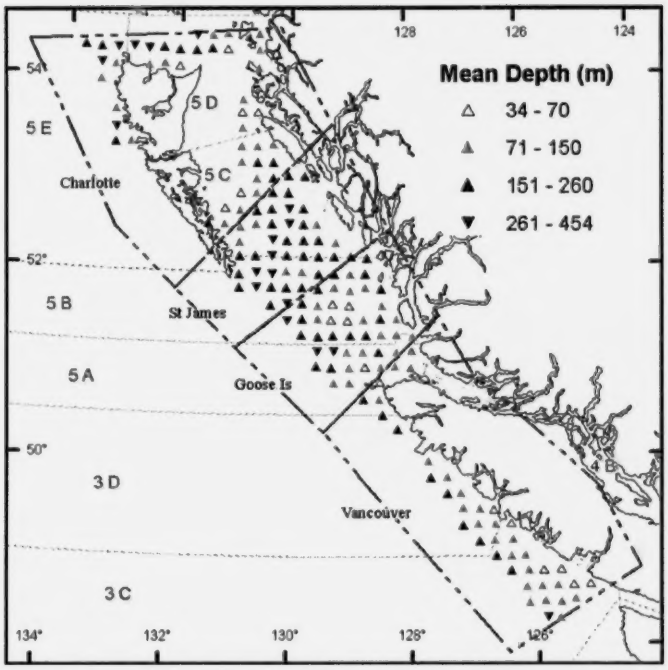


Figure 1. 2008 IPHC SSA survey stations grouped by mean depth of fishing in metres.

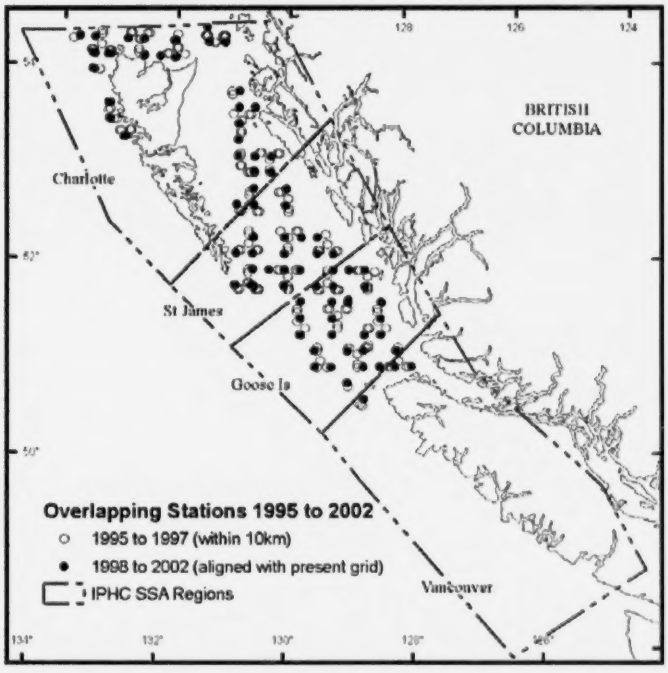


Figure 2. Locations of the subset of IPHC SSA survey stations used to calculate the relative abundance index from 1995 to 2002, which includes those stations sampled in all years (1995 – 2002) and located within 10 kilometres of each other.

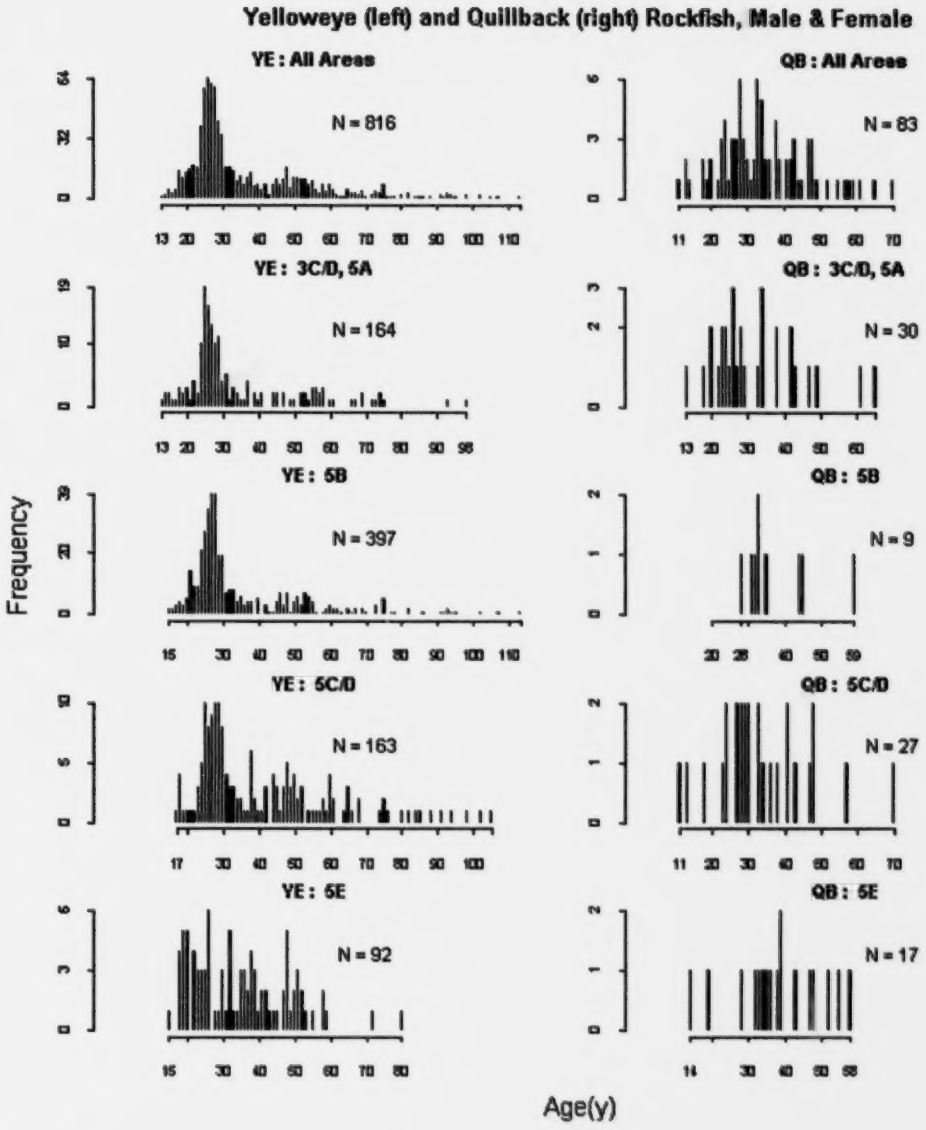


Figure 3. Age frequency histograms for all areas and by PSMFC Area for Yelloweye Rockfish (left column) and Quillback Rockfish (right column), male and female combined, using data collected on the 2008 IPHC SSA Survey.

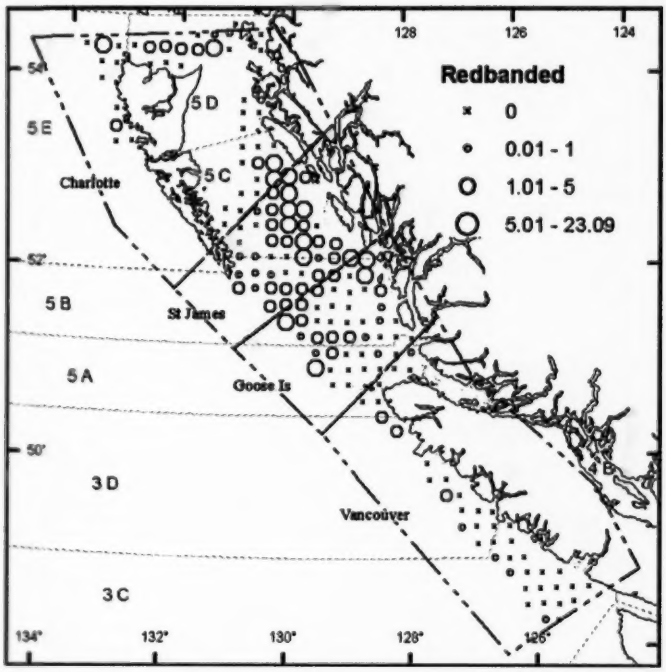


Figure 4 Catch rate of Redbanded Rockfish (in numbers of fish per 100 hooks) showing IPHC regions (heavy dashed outline) and DFO Management Areas (light dash).

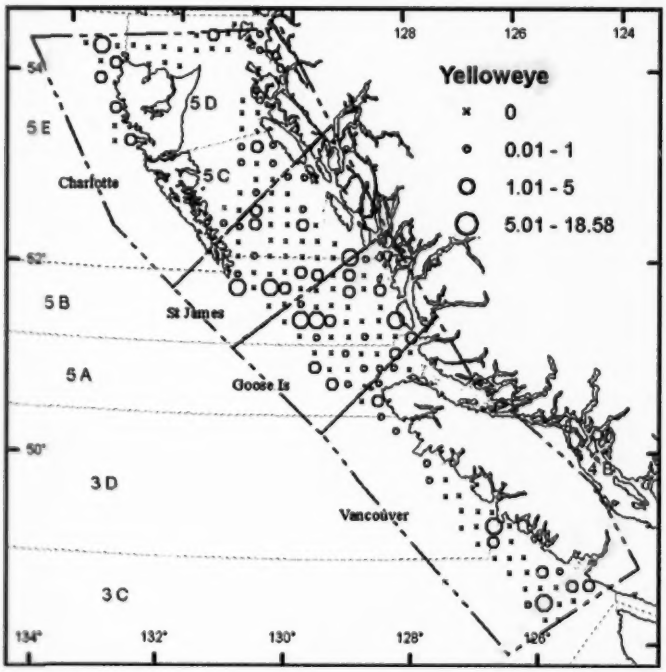


Figure 5. Catch rate of Yelloweye Rockfish (in numbers of fish per 100 hooks) showing IPHC regions (heavy dashed outline) and DFO Management Areas (light dash).

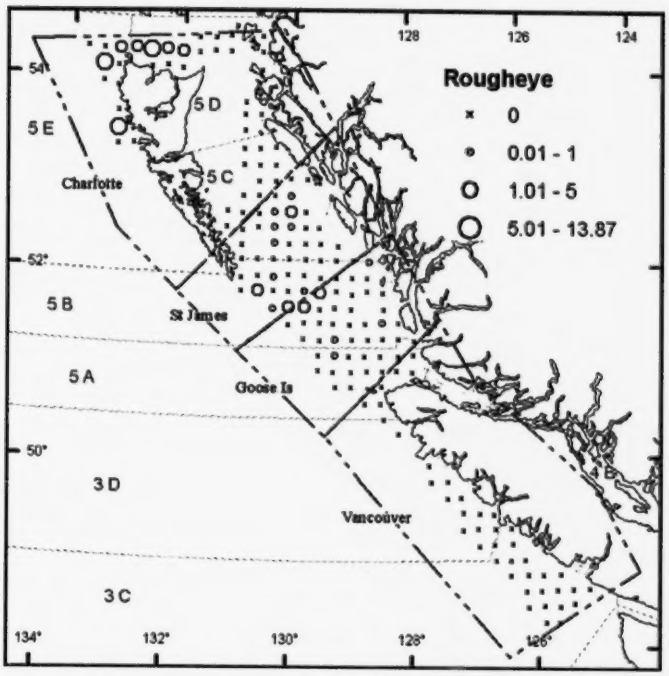


Figure 6. Catch rate of Rougheye Rockfish (in numbers of fish per 100 hooks) showing IPHC regions (heavy dashed outline) and DFO Management Areas (light dash).

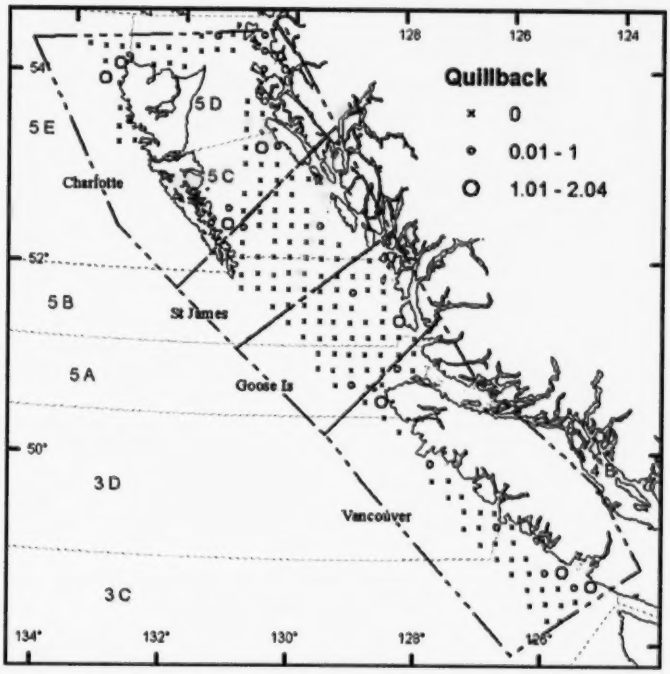


Figure 7. Catch rate of Quillback Rockfish (in numbers of fish per 100 hooks) showing IPHC regions (heavy dashed outline) and DFO Management Areas (light dash).

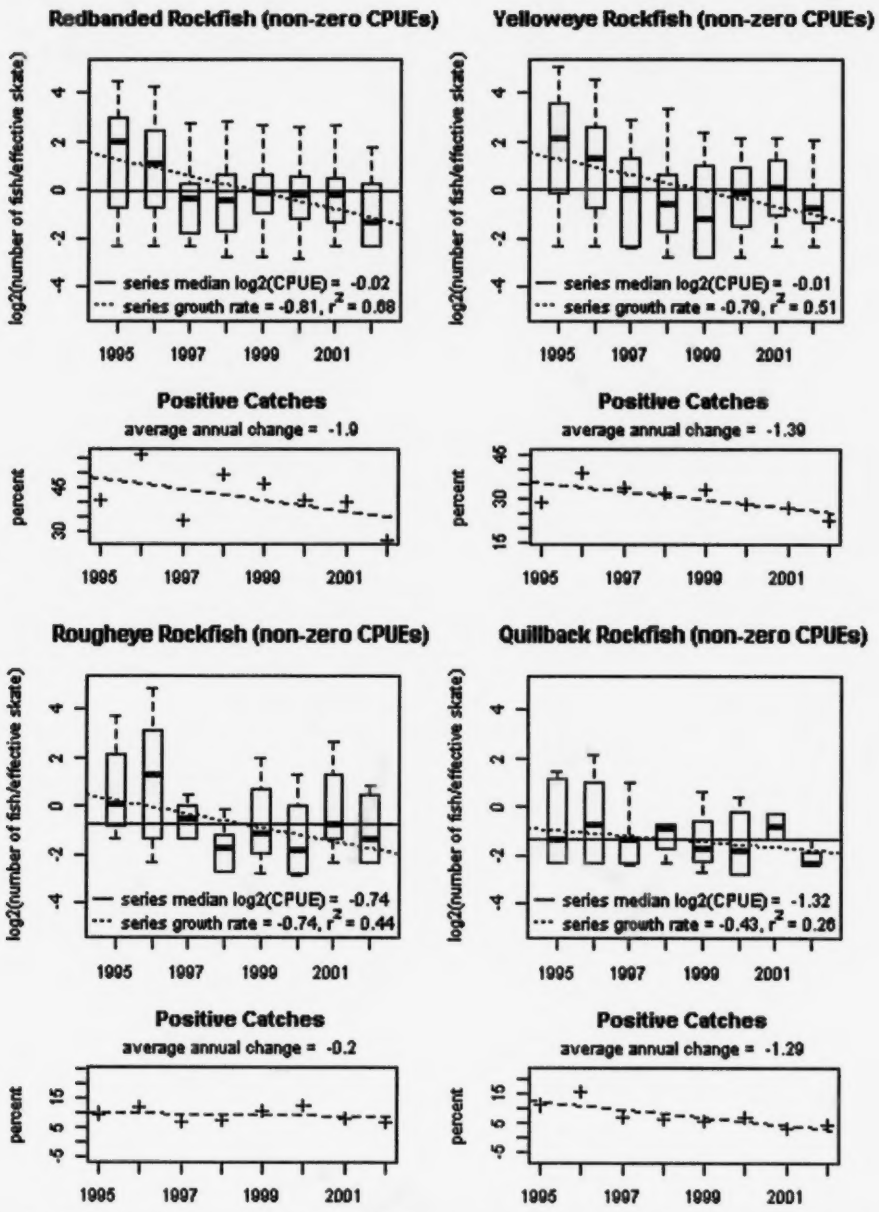


Figure 8. Catch rates from 1995 to 2002 for 4 common rockfish - Redbanded (top left), Yelloweye (top right), Rougheye (bottom left), and Quillback (bottom right). By species, upper panel: Relative abundance index ($\log_2$ (number of fish/effective skate)) for non-zero catches. Boxplots summarize annual non-zero data with a box for the upper (1st quartile) and lower (3rd quartile) hinges of the data, a bar for the median, and whiskers for the extremes of the data. Below the boxplots the series median log2 (CPUE) value, the series growth rate value (shown as a dashed line) together with the r^2 value are presented. Lower panel: Percent of positive catches by year shown by the "+" symbol with a dashed regression line and the annual change presented above the graph.

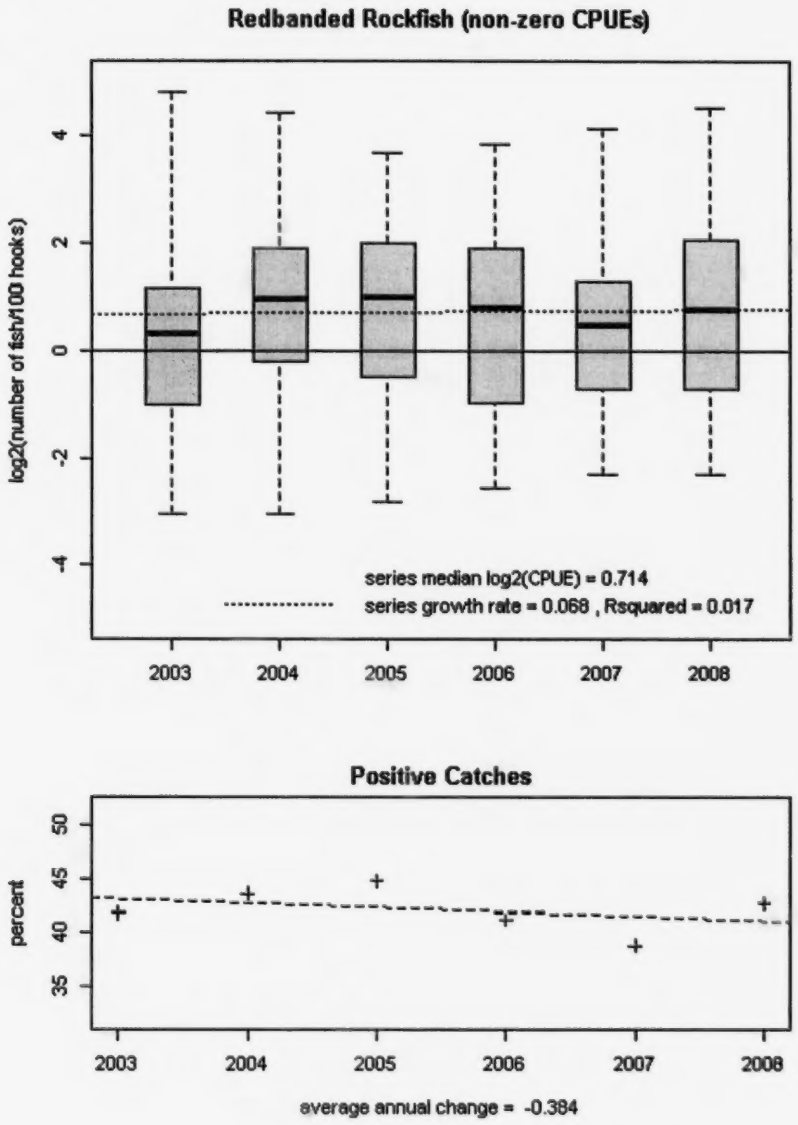


Figure 9. Upper panel: Relative abundance index ($\log_2$ (number of fish/100 hooks)) for non-zero catches of Redbanded Rockfish from 2003 to 2008. Boxplots summarize annual non-zero data with a box for the upper (3rd quartile) and lower (1st quartile) hinges of the data, a bar for the median, and whiskers for the extremes of the data. Below the boxplots the series median $\log_2$ (CPUE) value, the series growth rate value (shown as a dashed line) together with the R^2 value are presented. Lower panel: Percent of positive catches by year shown by the "+" symbol with a dashed regression line and the annual change presented below the graph.

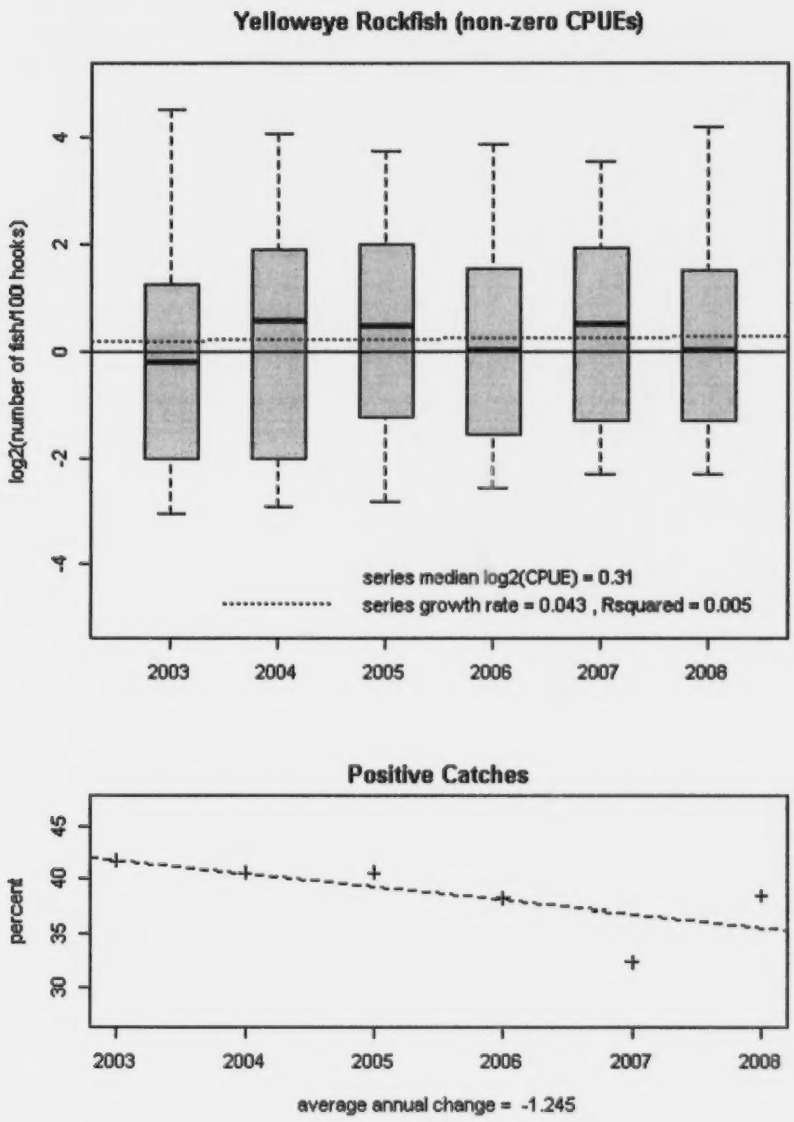


Figure 10. Upper panel: Relative abundance index ($\log_2$ (number of fish/100 hooks)) for non-zero catches of Yelloweye Rockfish from 2003 to 2008. Boxplots summarize annual non-zero data with a box for the upper (3rd quartile) and lower (1st quartile) hinges of the data, a bar for the median, and whiskers for the extremes of the data. Below the boxplots the series median $\log_2$ (CPUE) value, the series growth rate value (shown as a dashed line) together with the R^2 value are presented. Lower panel: Percent of positive catches by year shown by the "+" symbol with a dashed regression line and the annual change presented below the graph.

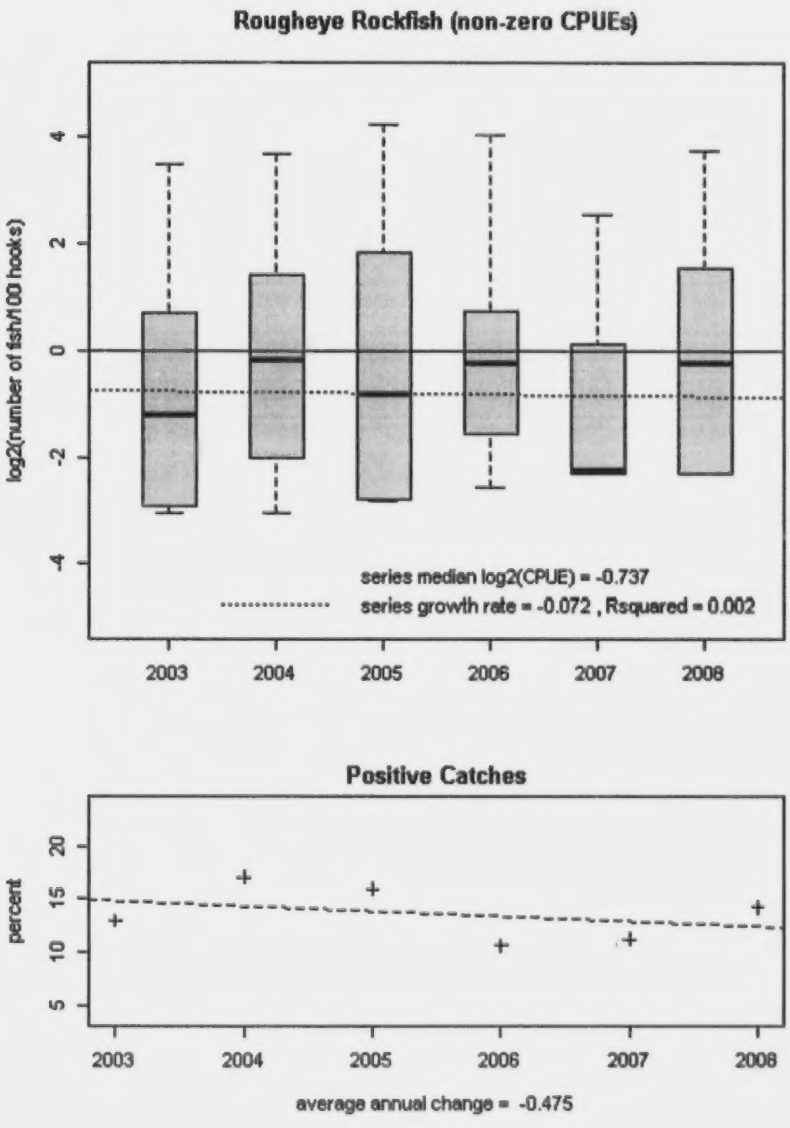


Figure 11. Upper panel: Relative abundance index ($\log_2$ (number of fish/100 hooks)) for non-zero catches of Rougheye Rockfish from 2003 to 2008. Boxplots summarize annual non-zero data with a box for the upper (3rd quartile) and lower (1st quartile) hinges of the data, a bar for the median, and whiskers for the extremes of the data. Below the boxplots the series median log2 (CPUE) value, the series growth rate value (shown as a dashed line) together with the R^2 value are presented. Lower panel: Percent of positive catches by year shown by the "+" symbol with a dashed regression line and the annual change presented below the graph.

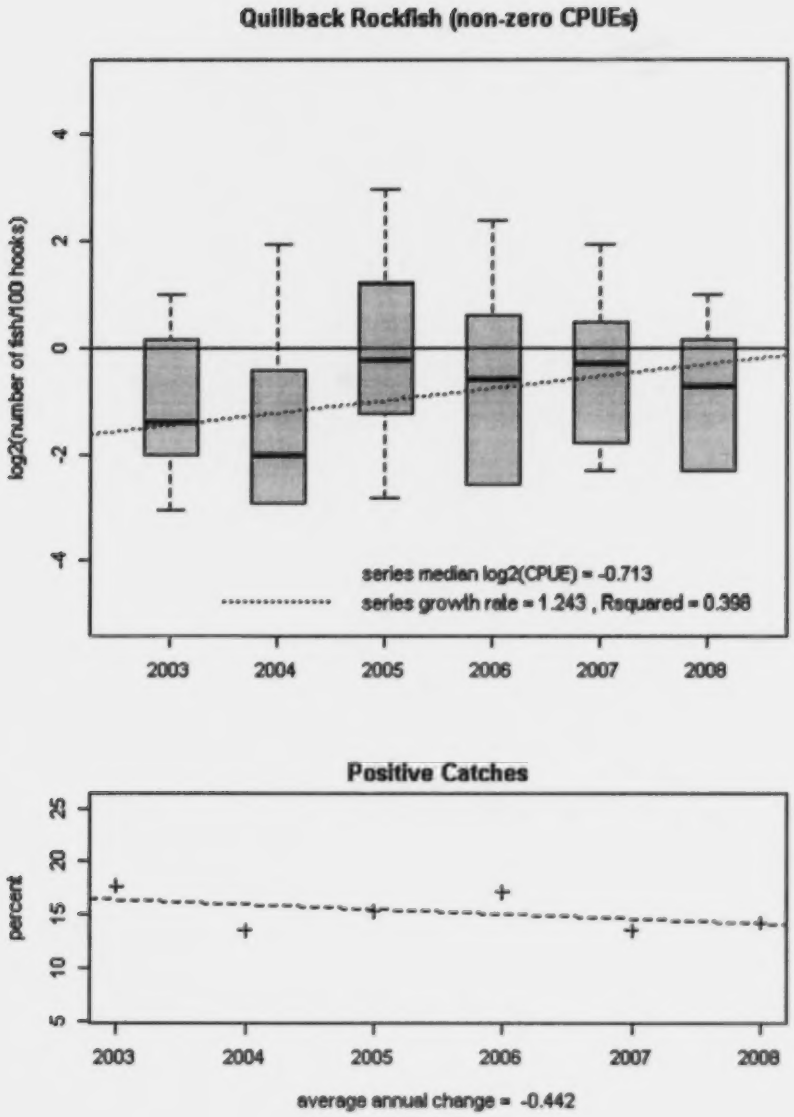


Figure 12. Upper panel: Relative abundance index ($\log_2$ (number of fish/100 hooks)) for non-zero catches of Quillback Rockfish from 2003 to 2008. Boxplots summarize annual non-zero data with a box for the upper (3rd quartile) and lower (1st quartile) hinges of the data, a bar for the median, and whiskers for the extremes of the data. Below the boxplots the series median $\log_2$ (CPUE) value, the series growth rate value (shown as a dashed line) together with the R^2 value are presented. Lower panel: Percent of positive catches by year shown by the "+" symbol with a dashed regression line and the annual change presented below the graph.

Appendix A. 2008 IPHC Survey Sampling Protocol

2008 Area 2B and SE Alaska bycatch sampling manual in pdf format.

2008 Protocols for non-halibut data collection in British Columbia and Southeast Alaska

Fairweather

Sitka

Ommaney

Ketchikan

Charlotte

St. James

Goose Islands

Vancouver

Contents

Introduction

In 2008 the IPHC will collaborate with the Department of Oceans and Fisheries, Canada (DFO) and the Sitka branch of the Alaska Department of Fish and Game (ADFG) to collect data on non-halibut species caught during the Standardized Stock Assessment survey (SSA). Data will be collected from the following SSA regions for their respective countries: Vancouver, Goose Islands, St. James, Charlotte, Ketchikan, Ommaney, Sitka, and Fairweather.

The aim of both projects is two-fold: record whole haul hook occupancy and collect biological data from rockfish. A third IPHC sea sampler will be deployed to the vessels fishing these regions in order to collect these data. Priority work for the sampler is to determine the hook by hook catch. The biological sampling of rockfish will be done as time permits and in no way should impinge upon standard IPHC setline survey objectives.

Although the data collected for both agencies are basically the same, there are several differences in sampling protocols. This manual will begin by discussing the sampling forms and general bycatch sampling guidelines; directions specific to each project will be outlined at the end of the document.

Hook-by-Hook Occupancy

Overview

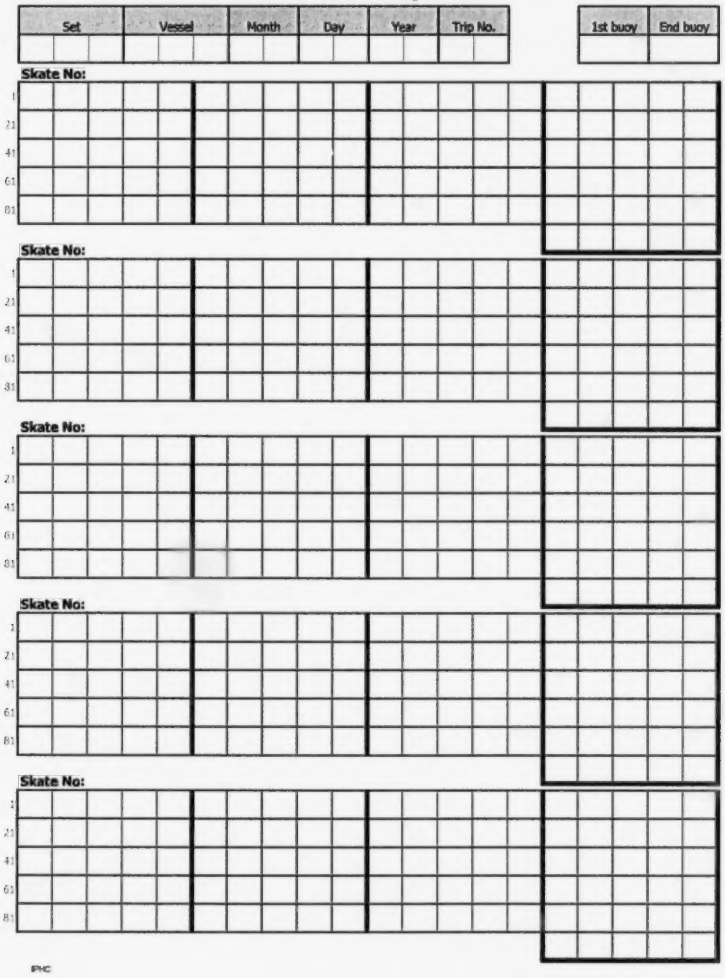
The IPHC collected hook-by-hook occupancy data on the SSA survey from 1993-1996 for internal research projects. Several individual projects in later years also collected these data. Sea samplers will use nomenclature developed during these projects to record hook occupancy on deck sheets.

The goal of whole-haul hook-by-hook sampling is to record the species caught in order along the line. Scientists will later use the species information to get a full accounting of all species caught and use the spatial information to examine the grouping of fish on the line by species. They may also overlay this catch data on habitat type to look for correlations between the two.

Hook Tally Form

Each tally form represents one IPHC set. Each form contains 5 blocks of squares. Each block of squares represents one skate of gear. Each block contains 105 squares and each square represents one hook. If the gear is within acceptable limits, there will never be more than 105 hooks per skate, and the hooks from one skate of gear will fit into one block of squares. Under no circumstances should you record information about two different skates of gear within one block of squares.

IPHC Hook Tally Form



Procedure

Header

Fill out header information prior to station haul back. Transcribe set number, vessel code, *date, trip number and buoy information* from the Set Form A.

Skate No

Observe retrieval of the first flag and buoy. Label the top block of squares on the Hook Tally Form with the appropriate skate number. Skates are numbered sequentially in the order set. If the gear is hauled backwards, you will begin the hook tally at the top block of squares using the **largest** skate number.

Hook Occupancy

Find a safe location on deck where you can observe the line where it breaks the water surface and passes the rollerman. It is important to have a clear view of the hooks as they come out of the water. Record an organism as soon as you are able to identify it accurately.

Record the state or occupancy of each hook, beginning at the top left-most square of the block and continuing across to the end of the row, then moving to the leftmost square on the second line and working across that row. Continue in this manner to the end of the skate. Always put the first hook of the set in the top, left-hand square, regardless of which end of the string the vessel begins haul-back from.

Identify and record all animals to the species level. Do your best to identify all invertebrates to the species level.

Use the standard set of shorthand Hook Tally Codes supplied in Appendix 1. Please use an upper case letter for each code. If there is not a shorthand code assigned to a species, write the numeric IPHC species code for the organism in the square. A detailed list of IPHC species codes is found in the 2008 SSA survey manual. An example of the top 10 hook tally codes used for animals in BC in 2007 is shown below.

When there is a skate change, make sure to begin recording hook occupancy in a new block of squares for the new skate. If there were less than 105 hooks on the skate, leave the remaining squares empty. Remember, hooks from different skates should never be recorded in adjacent squares.

Examples of frequently used hook tally codes

Common Name	Hook Tally Code
Spiny Dogfish	D
Pacific Halibut	H
Sablefish (Black cod)	BC
Arrowtooth Flounder	A
Yelloweye Rockfish	YE
Redbanded Rockfish	RB
Sunflower Sea Star	SN
Longnose Skate	LN
Lingcod	LC
Rougheye Rockfish	RE

Inanimate Objects

If the hook 'catches' or snags an inanimate object, fill in the square for that hook with the inanimate object code (IPHC species code 100).

Unidentified Plant Matter

If the hook 'catches' or snags sticks or logs, fill in the square for that hook with the unidentified plant matter code (IPHC species code 296).

Algae

Do not record the presence algae snagged by the hook or the line.

Hook Status

When a hook has not caught an object, record a code describing the state of the hook.

Shorthand codes for hook status

Hook status	Hook Tally Code
Empty Hook	E
Bait	B
Skin Hook	S
Bent/Broken/Missing	BM
Two spp/hook	depredator predator
Eaten	code %
Lost at roller	code #
Line Parts	/
Snarl- write brackets around the hooks involved in the snarl	[ ]

* For the Empty Hook code, you may use a lower case, hand-written "e", as long as the letter is written clearly.

Difference between 'Bait' and 'Skin Hook'

Use Hook Tally Code 'B' (Bait) when the retrieved hook contains the original bait, including the skin and all or part of the flesh. Use the Hook Tally Code 'S' (Skin) when the retrieved hook contains only the skin of the original bait, or there is a neglible amount of flesh left on the bait skin.

Unident. Codes

If you are not 100% confident you can correctly identify a discarded organism to the species level, ask the rollerman to bring it on board. Only unidentifiable escaped organisms should be recorded using an 'unidentified' code.

Code thornyheads on the line as "UI, Unidentified Idiot (Thornyhead)" whenever you do not have the fish in hand to identify it to the species level.

Protocols for anomalous events: (Refer to Figure 1 throughout)

Gear snarl

Gear snarls are the most frequent problem encountered during longline operations. When the gear becomes snarled it becomes difficult to accurately record the sequential order of hooks and catch. In this situation record all hooks and catch in the squares provided (do your best to estimate the sequential order) and then separate the hooks involved in the snarl with a set of square brackets (**[ ]**). The brackets will inform the data transcribers that these items were caught, but the order is unclear because of a gear snarl.

Parting of the gear

When the longline parts the vessel must travel to the other end (hereafter referred to as second end) in order to retrieve the gear. At the time when the groundline parts you should place a forward slash (**/**) after the last retrieved hook. When haul-back resumes from the second end you will need to record hook status in reverse order starting with the last square in the bottom block of squares. You will record hook status in reverse order from right to left following the entire length of the row. After the row is filled you will move to the next row above and start the process in the same manner. After the skate of gear finishes you will move to the next block of squares directly above and start in reverse order as before. In short, you will be filling the squares with hook information in the opposite direction from the way you were filling the squares before the gear parted. As a result, the total sequence of hooks on the page will still match the sequence of hooks on the line. When you finish the haul place another slash to the left of the last retrieved hook. There should be forward slashes on both ends of the parted gear to confirm the location of the parted gear to data entry personnel. Record the details of the gear parting in the logbook.

If the line parts before any hooks have been retrieved, complete the hook tally form as if nothing happened and make a note of the event in the logbook.

Two species caught on one hook

When two fish are caught on one hook, the first fish hooked is considered the predator, because it was predating the bait. The second fish is considered the depredator, because it was attacking the predator. The depredator is the species of interest. On the hook tally form, record the depredator first. Circle this code to note its importance and then record the code for the predator to the right of the circled depredator code. (e.g. (LC) RE)

Eaten

Write a percent (**%**) sign next to the code for the animal if the fish shows fresh bite wounds, heavy sandflea predation, or if only lips or a fish head come up on the line.

Animal lost at the roller (LAR)

Write a pound (**#**) sign next to the code for the animal, if a retained species is lost at the roller. In 2008, only rockfish, pacific cod, and halibut will be retained during survey, so only these species can be considered "lost at roller".

A skate has >105 hooks

If a skate has more than 105 hooks record occupancy of **all** hooks, using the side margin of the data form if necessary, clearly indicating hook order of any hooks outside the skate block.

Lost gear

If gear is lost during haulback estimate the number of hooks lost on each skate base on the number of hooks set and fill in the appropriate number of boxes with code '306'. If all skates are lost write "ALL GEAR LOST" across the Hook Tally Form for that set.

Figure 1: Hook Tally Form Example

IPHC Hook Tally Form

Set		Vessel			Month		Day		Year		Trip No.	
	2	3	S	T	W	0	6	2	2	0	8		3

1st buoy	End buoy
8	5

Skate No: 5

1	E	E	E	H	BC	H	E	E	S	S	E	B	A	B	H	E	B	E	E	RB
21	E	BC	RE#	S	H	B	S	E	RE	B	S	BC	RF	H	E	S	S	H	E	RB
41	E	H	BC	S	E	RB	E	E	E	SN	E	E	S	RE	S	E	BC	S	E	E
61	E	E	E	E	E	S	CR	S	BC	S	LN	E	E	S	S	SR	S	E	E	E
81	H	S	S	B	BC	E	S	S	YE	S	S	E	E	A	H	E	E			

Skate No: 4

1	[BC	E	E]	BC	E	E	E	[E	E]	S	BC	S	E	E	[E	E	S]	E	B	[E
21	E	E]	A	E	S	E	E	B	E	E	BC	E	E	BC	E	E	E	E	BC	E
41	E	[E	H]	BC	E	E	BC	S	E	E	E	E	E	E	E	E	E	[BC	BC]	E
61	E	E	E	E	E	BC	E	E	S	S	E	BC	E	E	/				/	E
81	E	E	S	BC	E	E	BC	B	B	E	E	E	YE	E	BC	BC	BC	BC	H	S
																E	154	E	BC	BC

Skate No: 3

1							E	E	S	S	E	S	S	B	S	G	E	E	E	E
21	E	BC	BC	E	BC	S	E	E	B	BC	E	E	E	H	S	BC	E	E	E	E
41	S	H	S	E	(H)RE	E	E	E	E	E	E	E	E	S	E	E	E	E	E	E
61	BC	E	E	E	H	H	E	E	E	E	B	S	H%	E	H	E	E	E	E	E
81	E	E	E	E	BC	E	H	E	H	H	BC	E	(H)UI	E	E	E	E	E	E	H
																B	E	E	H	E

D ← S ←

Skate No: 2

1	E	E	E	BI	D	D	B	E	S	S	D	B	B	B	D	B	B	E	D	B
21	E	S	LC	H	E	P	E	E	D	D	E	S	S	E	BC%	B	D	S	S	B
41	E	S	B	E	E	D	E	E	B	D	S	LN	B	D	E	D	D	E	B	D
61	E	B	S	D	D	E	S	E	E	[E	E	E	ST]	D	E	B	D	B	B	B
81	D	D	S	S	D	S	B	D	S	BI	B	B	H	E	E	E	S	D	E	B
																D	B	S	H	B

*skate 2 had 107 hooks

Skate No: 1

1						D	E	S	E	D	B	D	E	E	E	E	D	B	D	D
21	S	E	B	D	E	B	ST	E	E	D	D	E	E	D	B	B	D	D	S	S
41	E	S	S	E	D	E	E	E	D	ST	ST	D	G	D	E	E	D	D	E	E
61	D	D	E	E	D	E	ST	E	E	E	ST	SG	D	E	E	E	E	E	D	D
81	D	D	E	E	S	D	S	E	E	H	D	D	E	E	D	E	E	LC	H#	E
																[D	E	E	H	E]

Rockfish Biological Data Collection

Overview

The IPHC has created the Set Form C for recording biological data from non-halibut species. The Set Form C is similar in nature to the Set Form B, which is used for recording biological data from halibut. As with halibut sampling, the shack sampler will record rockfish data on the forms and put the otoliths in the trays. The third sampler will be occupied recording hook occupancy throughout haulback, so will not be available to collect biological data from rockfish until haulback is completed. The deck sampler's priority is halibut sampling. If halibut catch allows, the deck sampler may collect rockfish data opportunistically throughout the set.

Set Form C

Use the Set Form C to record data about one species on the front of the page, and the same or a different species on the back of the page. Do not record data from more than one set on one Set Form C. Fill out all header information, even if data on both sides of the paper are from the same species.

Set Form C

Page No. ____ of ____

Set	Vessel	Month	Day	Year	Trip no

Sample Method: 1 = whole haul; 2 = random sub-sample; 3 = non-random sub-sample

Fish State: 20 = Round; 4 = Gilled & Gutted

Not entered:

Common Name:	Species Code	Sample method

Collection Type: 1 = two otoliths in one cell; 3 = two otoliths in two cells and two trays; 5 = one otolith lost; 6 = both otoliths lost

Sex: M = Male; F = Female; U = Unident

Maturity: 1, 2, 3, 4, 5, 6, 7 or U

Comment Codes: I = Internal parasite; R = Tag recovery; C = Crystallized otolith; E = Eaten; S = Sand flea predation

	Weight (kg)	Length (cm)	Fish State	Otolith Number	Collection Type	Sex	Maturity	Comment	Oto tray: Remarks (not entered)
1	.								
	.								
	.								
	.								
5	.								
	.								
	.								
	.								
	.								
10	.								
	.								
	.								
	.								
	.								
15	.								
	.								
	.								
	.								
	.								
20	.								
	.								
	.								
	.								
	.								
25	.								

Record once per species per set:

Total no sampled for Set Form C _____

Total no observed on the Hook Tally Form _____

If there is a discrepancy, record the reason in the logbook

IPHC

Procedure

Rockfish will be collected and processed throughout the set. They do not have to be separated according to skate.

HEADER

Transcribe the set number, vessel code, date, and trip number from the Set Form A.

COMMON NAME

Write the common name of the species whose data will be recorded on the page.

SPECIES CODE

Record the numeric IPHC species code of the sampled species.

SAMPLE METHOD

Sample method describes the sampling system. There are three possible codes:

1 = whole haul: all retained fish of this species were sampled.

2 = random sub-sample: a random collection from the retained fish of this species was sampled.

3= non-random sub-sample: a portion of the retained fish were selected non-randomly for sampling.

In 2008 the sample method will be '1' (whole haul) for all species. Contact the office to discuss any changes in sample method.

WEIGHT

Record the weight the fish to the nearest tenth of a kilogram. The fish should be weighed round, not gilled or gutted.

LENGTH

Record the fork length, measured in cm. Fork length measures from the tip of the longest jaw to the center of the fork in the caudal fin. If the caudal fin is not forked, measure to the center of the caudal fin.

FISH STATE

Record the physical state of the fish at time you took the length measurement. If you have measured a fish that does not fit into either of the following codes, note this in the remarks field, and let the office know that you need a code for the new fish state.

4 = dressed, gills and guts removed, gonads intact

20 = round, gills and belly intact.

OTOLITH NUMBER

Record the number of the otolith. On each vessel and for each project the otoliths from each species will be numbered chronologically throughout the season. Begin at number one for each species.

Every sampled fish will have an otolith number, even if both otoliths are lost. If the otoliths are lost leave the cell empty for that fish, and record the number of the empty cell on the Set Form C as the otolith number. It may seem false to assign an otolith number to a fish from which no otoliths were retrieved, but this policy ensures that every sampled fish is accounted for and is a protocol required by the age labs of the agencies we are working with. Think of it as assigning an otolith cell number to every sample: every fish on the Set Form C receives a cell, regardless of the type of otolith collection made.

Collection Type

Collection type describes the type of specimen collected during sampling. There are four valid otolith collection codes in 2008.

1 = both otoliths collected and stored in one cell in the otolith tray

3 = both otoliths collected and stored in separate cells. The first otolith will go in cell 'N in tray A and the second otolith will go in cell 'N' in tray B.

For example: the first otolith goes in cell 44 in Tray 3 and the second otolith goes in cell 44 in Tray 4.

5 = one otolith lost; one otolith collected and stored in the otolith tray

6 = both otoliths lost

Sex

Record the sex of the fish. There are three acceptable codes:

M = Male

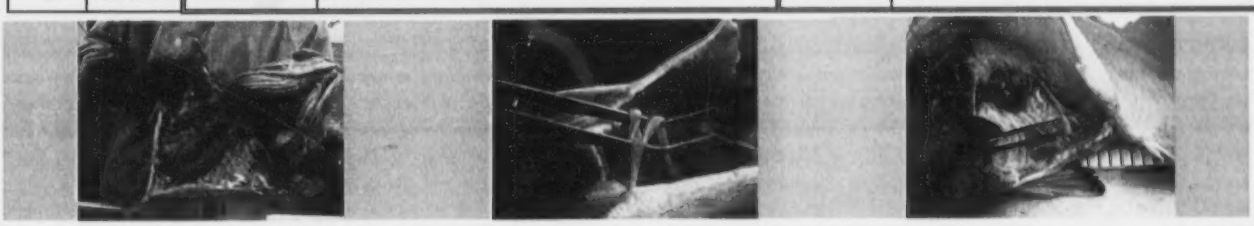
F = Female

U = Unidentified. Use the unidentified code if you are unable to classify the maturity, or were unable to observe the gonads for whatever reason.

Maturity

Consult the rockfish maturity guidelines outlined below and, to the best of your ability, assign a maturity to the sample. If you are unable to determine the maturity, or did not observe the gonads, use code U.

		Female		Male	
Maturity Code	*Maturity stage*	*Maturity sub-stage*	*Gonad Condition*	*Maturity sub-stage*	*Gonad Condition*
1	Immature	Immature	small translucent pink	Immature	threadlike translucent pink
2		Maturing	**small** yellow eggs no small black dots present (no reabsorbed larvae) translucent or opaque	Maturing	**string-like** slight swelling residual milt not present translucent
3	Mature	Developed eggs	**large** yellow or orange eggs a few small black dots may be present (reabsorbed larvae) **opaque**	Developing	**swelling** residual milt may be present in seminal vesicle brown-white
4		Fertilized eggs	**large** orange-yellow eggs **translucent**	Developed	**large** **easily broken** **white**
5		Embryos/larvae	large Embryos or larvae present- include **eyed eggs** translucent	Running	**running** sperm
6		Spent	large **flaccid** a few larvae may be present red ovaries	Spent	**sperm still in duct** white-brown
7		Resting	moderate size **firm** **orange-grey ovaries, some with dark blotches**	Resting	**small** **triangular in cross-section** **brown**
U	Unknown	Unknown	Unknown	Unknown	Unknown



Remember the following points while determining rockfish maturities:

- Mature rockfish cycle back to maturity stage **#3**, after the resting stage **#7**, for example: 1-2-3-4-5-6-**7-3**-4...
- Females- look for the presence of eyed larvae (small black dots on ovaries) to distinguish mature females (stage 3) from maturing females (stage 2) which do not have eyed larvae present.
- Males – look for the presence of residual milt in the seminal vesicle to distinguish mature testes (stage 3) from immature testes (stage 2), which will not have residual milt present.

Comment

There are five comment codes that may be entered in this column. You can only enter one code in the comment code field. If you encounter a fish that has more than one comment code, see the priority rules below. You may enter additional comment codes in the Remarks section.

Comment Codes (arranged in order from highest to lowest priority)

I = Internal parasite present. Use this code to indicate that you observed evidence of parasitic copepods- *Sarcotaces spp.*- in the gut cavity. According to *The Rockfishes of the Northeast Pacific* by Love, Yoklavich and Thorsteinson, adult *Sarcotaces* live in an internal cyst that is usually attached to the rectum, where it feeds off the blood of the host. The cyst often appears as a silver sac filled with black ink that, when burst, emits a black fluid.

R = Tag recovery. If you find a tagged rockfish collect the data required for the Set Form C, record the tag number in the remarks field, and put the tag in a completed tag envelope.

C = Crystallized otolith(s).

E = Eaten or bitten by dogfish, shark, whale, etc. Ignored healed bite wounds

S = Eaten by sand fleas.

Oto tray

This field was requested by samplers to track the trays they were using. It is not entered into the database, so you can use it as you please.

Remarks

Place any other information you find useful in this field, keeping in mind that it is not entered in the database, so end-users of this data will not see your comment unless they have the data sheet in hand.

Total no. sampled for Set Form C and Total no. observed on the Hook Tally Form

Record the total number of fish of that species sampled on the Set Form C for that set. Record the number of times that species was recorded on the Hook Tally Form. Do this once for each species on every set. The number observed on the Hook Tally Form should equal the number sampled on the Set Form C, after fish that were lost at the roller have been added. If there are irresolvable differences between the counts record the explanation in the logbook.

No rockfish caught?

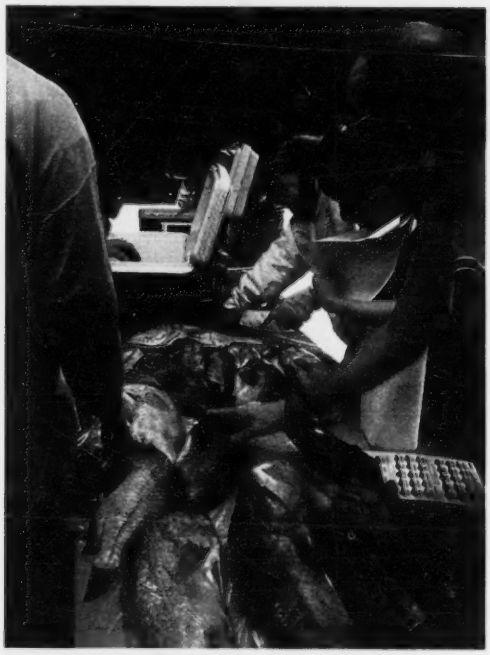
If no rockfish are captured on this set, it is not necessary to fill out a Set Form C. Please make sure to write "No Rockfish caught" in the Comments section of the Set Form A for that set.

Too many rockfish?

There may be times when you will not be able to complete all the required rockfish sampling before it is time to haul the next string. If this situation is encountered, the fish should be placed in baskets or buckets and stored out of the way in a cool place, (and separate from fish on the next string) until there is sufficient time to complete the sampling. You may

need to store the fish in the hold to maintain quality and food safety. There will be time to complete the sampling at the end of the day.

If whole-haul sampling of rockfish begins to negatively affect halibut sampling call the Seattle office to receive sub-sampling directions that have been approved by DFO and ADFG.



Otolith Collection

Collection

Collect both otoliths from each fish, and place them together in one cell in the otolith tray. Make cuts for otolith extraction from the inside of the gill cavity to avoid damaging the outside of the fish. Cuts to the outside of the head can negatively affect the salability of the product.

Cleaning and storage

Rockfish otoliths do not need to be kept in glycerin, but must be stored clean and dry. **Make sure to remove all blood and membranes from the otoliths and wipe them dry with a towel before storing them in the tray.** Take time at the end of the day or while the vessel is setting the following morning to ensure the otoliths are completely clean.

Crystallized otoliths

Collect crystallized otoliths and process them in the same manner as un-crystallized otoliths. Record 'C' in the Comment field.

Broken otoliths

Save and collect the pieces of broken otoliths.

Tray numbering

Otoliths will be stored in separate trays for each species. Record the tray number on the otolith label affixed to the lid as Tray # __ of __. If your vessel is fishing in both BC and Alaska you must keep a separate set of trays for fish caught in each country, as the trays of otoliths will be sent to their respective labs at the end of the season to be aged.

Cell numbering

Otolith trays contain one hundred cells that are numbered by the IPHC from 1 to 100 and from left to right and top to bottom. The plastic molding on the tray shows a different numbering system, but your tray bien holder is numbered with the IPHC system for reference.

Cells will be filled sequentially throughout the season on each vessel, starting at 1 for each species, vessel and **country**. The cell number on the otolith tray will always correspond to the otolith number recorded on the Set Form C. Throughout the set, double check that you have the same number of otoliths in the tray as you have on the Set Form C, and that any fish with Collection type of 6 are represented in the tray by an empty cell.

Do not skip cells between sets or trips: always start the next set and the next trip in the next available cell. Place a paper star in the first and last cell of each tray and at the beginning and end cells of each trip. Mark the paper star with the vessel code, trip number, Hook Tally species code and otolith number.

Lost otoliths

If you lose one otolith, collect the remaining otolith and record code 5 (one otolith lost) in the Collection Type field. The single otolith will occupy the cell that corresponds to the otolith number.

If you lose both otoliths collect the remaining data from the fish, record the otolith number, record code 6 (both otoliths lost) in the Collection Type field, and leave the corresponding otolith cell empty. For the next fish ensure the otolith number matches the next cell in the otolith tray. Because trays will be filled sequentially and completely, the only empty cells in a tray will represent sampled fish with both otoliths lost.

Large otoliths

If otoliths are too large to fit into the cell, you may nip the tips off the otoliths so they will fit in the cell. Avoid making a break near the center of the otolith. Try to avoid breaking otoliths if at all possible.

If the otoliths are still too large to fit in one cell, you will need to spread them across two cells and two trays. In order to maintain the link between otolith number and cell number you will put the second otolith in the same cell number in a **new tray.** For example, if the 44th sampled Rougheye rockfish has otoliths that are too big to fit into one cell store one otolith in cell 44 of the first otolith tray and the second otolith in cell 44 of the second otolith tray. This may seem like a 'waste' of tray space, but it is currently the best method to collect two large otoliths and maintain a numbering system that allows you to coordinate otolith number with cell number. In this instance record code 3 (two otoliths split in two cells and two trays) in the Collection Type field. For the next fish, use the next consecutive otolith number and store the otoliths in the next available cell **in the new tray**. Leave the remaining cells in the old tray empty.

Mailing Otoliths

Mail otoliths to Seattle after the boat has completed all charter regions for the project for the season. If you do not have sufficient storage space on your vessel for the full trays you may mail **completed** trays to Seattle as needed. If you accidentally mail a tray of otoliths with unused cells midseason, start the next tray on the next cell number. Cell number should always match fish number.

For Example:

Trip two has ended with yelloweye fish number 332. The cases have been mailed back to the lab, so trip three will start with a new case. The first yelloweye otolith number will be 333, and its otolith will be placed in cell 33.

Use rubber bands and tape to secure the lid of the tray, and vacuum seal the otoliths in the same manner you prepare halibut otoliths for mailing. Package rockfish otoliths separately from halibut otoliths. Clearly mark the outside of the package to indicate it contains rockfish otoliths.

Other Issues

20 hook count

If you are completing a Hook Tally Form for a set, you are NOT required to complete "Part 2: Subsample" on the back of the Set Form A. You still must complete "Part 1: Whole Haul Sample" for missing bait, marine mammals and seabirds.

Data editing

The total number of rockfish in your hook-by-hook tally will equal the total number of samples on the Set Form C's if you were able to sample all rockfish for that set.

End of Trip Summary

Include the last otolith number of each rockfish species in the End of Trip Summary in your logbook.

Vessel Logbooks

There is no requirement for the IPHC sampler to fill out the vessel logbook; this is solely the responsibility of the charter vessel captain. Additionally, there is no need for the IPHC sampler to report catch data to the dockside monitors. This is also the responsibility of the captain. If you have time and would like to do so, you may assist the captain with these responsibilities by sharing bycatch information with him. IPHC surveys are cooperative ventures and we encourage all members of the team to work together to complete the charter.

Mailing data forms

Collate the Set Form Cs with the Set Form A and Set Form Bs for each set.

Keep the Hook Tally Forms seperate. When you are preparing to mail the data packets clip the Hook Tally Forms by trip. Attach a note to the front of each packet that indicates which IPHC Regulatory Area the trip was from.

Evaluations

Your feedback on any aspect of this project is welcomed at any time throughout the season.

The lead, second and third samplers should each fill out an evaluation of the project at the end of their time on the vessel, or at the end of the project, whichever occurs first. These **special project evaluations** are in the Admin pack. Mail completed evaluations with end of trip documents.

Collection of non-halibut data in Area 2B

From 2002 through 2006, the DFO contracted Archipelago Marine Research (AMR) to place biologists on IPHC survey vessels fishing in Canadian waters. In 2007 the IPHC trained survey biologists to collect this data during the SSA survey. The goals of the project remain the same, and every effort has been made to ensure continuity of data fields and collection methods from 2002 through 2008.

Hook-by-Hook Occupancy

Complete a Hook Tally Form for every set in Area 2B.

Set Form C

The vessel will retain all rockfish from each set. The sampling goal is to collect length, sex, maturity and otoliths (LSMO) from retained *Sebastes* species. LSMO data will not be collected from *Sebastolobus* species (thornyheads).

Sample **all** *Sebastes spp.* This is a different procedure than is currently being performed by observers on commercial vessels in Canada.

It is best to have the crew dress rockfish as they come on board (remove the gills and slit the bellies, leaving the gonads intact). This will speed up the sampling and decrease the time required by IPHC staff and vessel crew to process the samples after haulback is complete.

Weights

You do not need to collect weights from sampled rockfish.

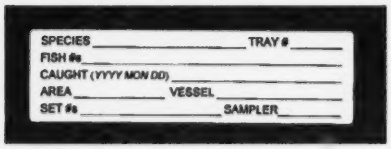
Otoliths

If you are sampling on the Proud Venture in 2008 make sure to start numbering Yelloweye otoliths at '1' when you begin fishing in Canada.

Otolith Collection

DFO has supplied the IPHC with Tray Biens™ for storing rockfish otoliths. These trays have special labels that should be completed as outlined below.

DFO Rockfish otolith tray label



SPECIES

Record the Latin name for the species.

TRAY #

Label the trays as '1 of 3': '2 of 3'; and '3 of 3'.

FISH NUMBER

Record the range of otolith numbers in the tray.

CAUGHT

Record the range of dates the otoliths were obtained, in the following format: YYYYmonDD (e.g. 2007Jun04 – 2007Jul17).

AREA

List all DFO Areas in which these fish were caught (Appendix 3 lists the DFO area for each IPHC station).

VESSEL

Record the full name of the vessel.

SET NUMBERS

Record the range of set numbers included in the tray.

SAMPLERS

Record the full name of the lead sampler.

Unidentified rockfish and unknown maturities

If you are unable to confidently identify a rockfish or have problems classifying the maturity level of a sampled fish, please utilize the resources listed below to ensure the correct ID and maturities are assigned.

1. Call or email a DFO representative for advice

Lynne Yamanaka is the lead scientist on this project and the end-user of the data you are collecting. Telephone her from the vessel to discuss any problems you have with identifications or maturities.

If you are unable to contact Lynne, call the DFO port samplers from Vancouver and Prince Rupert for assistance.

DFO contact information:

Lynne Yamanaka (Project director)	office: 250-756-7211 cell: 250-714-9251 email: Lynne.Yamanaka@dfo-mpo.gc.ca
Schon Acheson (Vancouver)	office: 604-666-2658 cell: 604-209-4184 email: AchesonSm@pac.dfo-mpo.gc.ca
Kristina Anderson (Prince Rupert)	office: 250-627-3475 email: AndersonKr@pac.dfo-mpo.gc.ca

2. Save the specimen for later analysis

Label a freezer bag for the sample with the following information: "IPHC research", vessel name, date, set number, your name, otolith number, and the species name or maturity code you have assigned the fish on the data sheet.

Record all label information in the logbook and outline the difficulties of the identification.

Freeze the sample and pass it to a port sampler as outlined in the next point.

3. Discuss the identification with the DFO or AMR port sampler at landing

If you are offloading in Prince Rupert of Vancouver, call the DFO port sampler to arrange a meeting with them at offload. At the dock you can discuss the species ID or rockfish maturity with them, and give them the frozen sample so they can pass it on to the DFO office for further examination if necessary.

It is priority to give the specimen to a DFO sampler in Prince Rupert rather than an AMR port sampler. If you are offloading at other BC ports, you can ask the AMR port sampler for advice and give the frozen fish to them to store for DFO.

Double-check the specimen is well-labeled before handing it off to the port sampler. Record the name of the port sampler and any other details of the discussion in the logbook offload summary notes for that delivery.

Collection of non-halibut data in Southeast Alaska

The IPHC began working with the Sitka office of ADFG to collect non-halibut data on SSA survey in 2007. Sea samplers tagged all demersal shelf rockfish with Floy tags and recorded their occurrence by skate. ADFG port samplers met the vessels at the dock and collected further biological data from each specimen.

ADFG is most interested in acquiring detailed biological data from Yelloweye rockfish, as well as counts of ling cod and sablefish on halibut gear. In 2008, due to their need for more detailed data, ADFG has asked the IPHC to collect hook occupancy data and biological data from Yelloweye rockfish for all sets in the Ketchikan, Ommaney, Sitka and Fairweather regions.

Hook-by-Hook Occupancy

Complete a Hook Tally Form for every set in the Ketchikan, Ommaney, Sitka and Fairweather regions.

Set Form C

All rockfish in SE Alaska must be retained for delivery, but you should only sample Yelloweye rockfish for biological data.

Weights

Rockfish weights are especially important to biologists at ADFG, so weigh each fish as accurately as possible with a spring scale. Make sure you record a round weight for each fish: do not weigh the fish after it has been dressed or the otoliths have been removed.

Otoliths

If you are sampling on the Proud Venture in 2008 make sure to start numbering Yelloweye otoliths at '1' when you begin fishing in Alaska.

Sex and Maturity

To avoid the need to gut the fish, do not cut the fish open to identify the sex: **collect sex data externally. You do not need to record maturity.** You may slit open the fishes belly to double-check your external identification as needed, but keep this to a minimum. If you do slit the animal, be sure that it is gutted and belly iced after your inspection to minimize spoiling.

Otolith Collection

Extract the otoliths from the inside of the head, to avoid damaging the outside of the product.

ADFG has supplied the IPHC with black tray biens to use for storing and mailing Yelloweye otoliths. Complete and affix a standard IPHC Rite-in-the-Rain label to the lid of each tray. Record the following additional information in the top right corner of the label: "YE" and "Tray __ of __".

Appendix 1: Hook Tally Codes

Round and Flat Fish			
IPHC Species Code	Common Name	Scientific Name	Hook Tally Code
2	Arrowtooth Flounder	Atheresthes stomias	A
12	Dover Sole	Microstomus pacificus	DS
64	Flatfish, unident.	Pleuronectiformes	UF
3	Flathead Sole	Hippoglossoides elassodon	FS
37	Giant Wrymouth	Delolepis gigantia	WE
148	Great Sculpin	Myoxocephalus polyacanthocephalus	GS
16	Greenland Turbot	Reinhardtius hippoglossoides	GT
23	Greenling, unident.	Hexagrammidae	G
42	Grenadier (Rattail), unident.	Macrouridae	RT
152	Kamchatka Flounder	Atheresthes evermanni	KF
21	Lingcod	Ophiodon elongatus	LC
26	Pacific Cod	Gadus macrocephalus	C
86	Pacific Hake	Merluccius productus	PH
1	Pacific Halibut	Hippoglossus stenolepis	H
14	Petrale Sole	Eopsetta jordani	P
145	Red Irish Lord	Hemilepidotus hemilepidotus	RL
4	Rock Sole, unident.	Lepidopsetta sp.	RS
34	Ronquil, unident.	Bathymasteridae	RQ
27	Sablefish (Blackcod)	Anoplopoma fimbria	BC
20	Salmon, unident	Salmonidae	SA
29	Sculpin, unident.	Cottidae	SC
56	Spotted Ratfish	Hydrolagus colliei	RF
28	Walleye Pollock	Theragra chalcogramma	PO
146	Yellow Irish Lord	Hemilepidotus jordani	YL

Rockfish			
IPHC Species Code	Common Name	Scientific Name	Hook Tally Code
132	Blackgill Rockfish	Sebastes melanostomus	BG
127	Bocaccio	Sebastes paucispinis	BO
57	Canary Rockfish	Sebastes pinniger	CA
88	China Rockfish	Sebastes nebulosus	CH
58	Dusky Rockfish	Sebastes ciliatus	DR
154	Greenstriped Rockfish	Sebastes elongatus	GN
59	Northern Rockfish	Sebastes polyspinis	NR
87	Quillback Rockfish	Sebastes maliger	QB
90	Redbanded Rockfish	Sebastes babcocki	RB
121	Rosethorn Rockfish	Sebastes helvomaculatus	RO
31	Rougheye Rockfish	Sebastes aleutianus	RE
119	Shortraker Rockfish	Sebastes borealis	SR
60	Silvergray Rockfish	Sebastes brevispinis	SG
45	Unident. Rockfish	Sebastes spp	R
136	Widow Rockfish	Sebastes entomelas	WI
89	Yelloweye Rockfish	Sebastes ruberrimus	YE
128	Yellowmouth Rockfish	Sebastes reedi	YM
122	Yellowtail Rockfish	Sebastes flavidus	YT

Skates and Sharks			
IPHC Species Code	Common Name	Scientific Name	Hook Tally Code
137	Alaska Skate	Bathyraja parmifera	AK
138	Aleutian Skate	Bathyraja aleutica	AL
167	Bering Skate	Bathyraja interrupta	BE
141	Big Skate	Raja binoculata	BI
140	Black Skate	Bathyraja trachura	BS
126	Blue Shark	Prionace glauca	BL
169	Commander Skate	Bathyraja lindbergi	CK
168	Golden Skate	Bathyraja smirnovi	GO
143	Longnose Skate	Raja rhina	LN
142	Sandpaper Skate	Bathyraja kincaida	SD
63	Shark, unident.	Elasmobranchii	SH
55	Skate, unident.	Rajidae	SK
125	Sleeper Shark	Somniosus pacificus	SS
129	Soupfin Shark	Galeorhinus zyopterus	SF
54	Spiny Dogfish	Squalus acanthias	D
156	Whiteblotched Skate	Bathyraja maculata	W

Invertebrates			
IPHC Species Code	Common Name	Scientific Name	Hook Tally Code
211	Basketstar	Gorgonocephalus eucnemis	BK
106	Bryozoa, unident.	Bryozoa	BZ
95	Coral, unident.	(includes hard and soft)	CO
209	Fish-eating Star	Stylasterias Forreri	FE
218	Glass Sponge, unident.	Hexactinellida	GL
51	Octopus, unident.	Octopoda	O
52	Scallop, unident.	Pectinid	US
93	Sea Anemone, unident.	Actiniaria	AN
73	Sea Cucumber, unident.	Holothuroidea	CU
92	Sea Pen, unident.	Pennatulacea	SE
82	Sea Urchin, unident.	Echinoidea	SU
103	Shells, unident.	(includes bivalve and gastropods)	SL
91	Sponge, unident.	Porifera	SP
81	Starfish, unident.	(includes brittle and basketstars)	ST
210	Sunflower Sea Star	Pycnopodia helianthoides	SN

Other	
IPHC Species Code	Common Name
100	Inanimate Object
296	Unidentified plant matter

Appendix 2: Summary of 2007 rockfish catch by station

Vancouver Region:

Station Number *	Species	Total number sampled (2007) **
2002	Rougheye Rockfish	5
	Shortraker Rockfish	2
2005	Yelloweye Rockfish	14
2006	Yelloweye Rockfish	1
2007	Quillback Rockfish	13
	Yelloweye Rockfish	1
2008	Yelloweye Rockfish	1
2012	China Rockfish	6
	Quillback Rockfish	4
	Yelloweye Rockfish	3
2013	Quillback Rockfish	3
	Yelloweye Rockfish	3
2015	Redbanded Rockfish	1
2016	Quillback Rockfish	2
2018	Redbanded Rockfish	1
2024	China Rockfish	1
	Quillback Rockfish	3
	Yelloweye Rockfish	30
2026	Redbanded Rockfish	4
2027	Quillback Rockfish	1
2031	Redbanded Rockfish	10
	Yelloweye Rockfish	2
2035	Redbanded Rockfish	11
	Yelloweye Rockfish	20
2037	Redbanded Rockfish	30
	Yelloweye Rockfish	13
2038	Quillback Rockfish	7
	Yelloweye Rockfish	12
2039	Redbanded Rockfish	1
	Silvergray Rockfish	3
	Yelloweye Rockfish	1
2040	Canary Rockfish	1
	Quillback Rockfish	7
	Yelloweye Rockfish	1
2042	Yelloweye Rockfish	1

* Stations with no rockfish present have been omitted from this list
** on 5 skates of gear

Goose Islands Region:

Station Number *	Species	Total number sampled (2007) **
2044	Quillback Rockfish	1
	Yelloweye Rockfish	13
2045	Bocaccio	1
	Greenstriped Rockfish	1
	Silvergray Rockfish	8
	Yelloweye Rockfish	34
2049	Yelloweye Rockfish	1
2050	Redbanded Rockfish	16
	Silvergray Rockfish	2
	Yelloweye Rockfish	11
2051	Quillback Rockfish	1
	Yelloweye Rockfish	18
2052	Redbanded Rockfish	6
	Yellowmouth Rockfish	1
2055	Redbanded Rockfish	4
	Rougheye Rockfish	1
	Shortraker Rockfish	3
2057	Yelloweye Rockfish	5
2060	Greenstriped Rockfish	1
	Redbanded Rockfish	3
2061	Redbanded Rockfish	11
	Rougheye Rockfish	1
2062	Redbanded Rockfish	3
	Rougheye Rockfish	1
2063	Redbanded Rockfish	1
2064	Redbanded Rockfish	7
2065	Quillback Rockfish	4
	Yelloweye Rockfish	27
2066	Redbanded Rockfish	3
	Rougheye Rockfish	1
2069	Yelloweye Rockfish	6

Station Number *	Species	Total number sampled (2007) *
2070	Bocaccio	1
	Quillback Rockfish	1
	Yelloweye Rockfish	39
2071	Canary Rockfish	1
	Redbanded Rockfish	3
	Silvergray Rockfish	2
	Yelloweye Rockfish	58
2072	Redbanded Rockfish	9
	Shortraker Rockfish	1
	Yellowmouth Rockfish	2
2073	Canary Rockfish	1
	Redbanded Rockfish	2
	Yelloweye Rockfish	2
2077	Redbanded Rockfish	6
	Rougheye Rockfish	2
	Yellowmouth Rockfish	1
2078	Quillback Rockfish	5
	Redbanded Rockfish	11
	Yelloweye Rockfish	4
2079	Bocaccio	1
2080	Quillback Rockfish	2
	Yelloweye Rockfish	9
2081	Bocaccio	1
	Silvergray Rockfish	1
2082	Redbanded Rockfish	13
	Shortraker Rockfish	1
2083	Redbanded Rockfish	10
2084	Yelloweye Rockfish	6
2086	Redbanded Rockfish	23
	Silvergray Rockfish	1
	Yelloweye Rockfish	5

* Stations with no rockfish present have been omitted from this list
** on 5 skates of gear

St. James Region:

Station Number *	Species	Total number sampled (2007) **
2087	Rougheye Rockfish	3
	Shortraker Rockfish	2
	Yellowmouth Rockfish	1
2088	Darkblotched Rkfish	1
	Redbanded Rockfish	8
2089	Redbanded Rockfish	13
	Shortraker Rockfish	1
2090	Redbanded Rockfish	2
	Silvergray Rockfish	4
	Yelloweye Rockfish	7
2091	Bocaccio	1
	Redbanded Rockfish	7
	Yelloweye Rockfish	21
2092	Redbanded Rockfish	1
	Rougheye Rockfish	4
	Yellowmouth Rockfish	2
2093	Redbanded Rockfish	7
	Silvergray Rockfish	4
	Yelloweye Rockfish	51
2094	Redbanded Rockfish	28
	Yelloweye Rockfish	7
2095	Silvergray Rockfish	2
	Yelloweye Rockfish	19
2098	Redbanded Rockfish	2
2099	Yelloweye Rockfish	2
2100	Bocaccio	2
	Canary Rockfish	2
	Redbanded Rockfish	35
	Yelloweye Rockfish	52
2101	Redbanded Rockfish	3
2102	Redbanded Rockfish	7
2103	Redbanded Rockfish	2
2105	Rougheye Rockfish	1
2106	Redbanded Rockfish	6
	Silvergray Rockfish	1

Station Number *	Species	Total number sampled (2007) *
2107	Redbanded Rockfish	1
2108	Redbanded Rockfish	2
2109	Redbanded Rockfish	15
2110	Redbanded Rockfish	80
	Silvergray Rockfish	1
2111	Redbanded Rockfish	20
	Silvergray Rockfish	1
2112	Redbanded Rockfish	3
	Rougheye Rockfish	1
2113	Yelloweye Rockfish	3
2115	Quillback Rockfish	1
2116	Bocaccio	1
	Redbanded Rockfish	4
	Silvergray Rockfish	1
	Yelloweye Rockfish	4
2117	Redbanded Rockfish	19
2118	Redbanded Rockfish	8
	Silvergray Rockfish	1
2119	Canary Rockfish	4
	Tiger Rockfish	1
	Yelloweye Rockfish	17
2120	Silvergray Rockfish	1
2121	Redbanded Rockfish	7
	Yelloweye Rockfish	1
2122	Redbanded Rockfish	3
	Shortraker Rockfish	4
2123	Redbanded Rockfish	45
2124	Yelloweye Rockfish	19
2125	Redbanded Rockfish	8
	Shortraker Rockfish	1
2126	Redbanded Rockfish	8
2127	Redbanded Rockfish	27
2128	Redbanded Rockfish	7

* Stations with no rockfish present have been omitted from this list
** on 5 skates of gear

Charlotte Region:

Station Number *	Species	Total number sampled (2007) **
2129	Quillback Rockfish	8
	Yelloweye Rockfish	12
2130	Quillback Rockfish	2
	Yelloweye Rockfish	5
2135	Redbanded Rockfish	42
	Rougheye Rockfish	1
2136	Bocaccio	1
2137	Redbanded Rockfish	19
2137	Yelloweye Rockfish	7
2138	Redbanded Rockfish	8
2140	Yelloweye Rockfish	1
2141	Quillback Rockfish	13
	Rosethorn Rockfish	1
	Yelloweye Rockfish	36
2142	Quillback Rockfish	1
	Redbanded Rockfish	2
	Yelloweye Rockfish	1
2143	Canary Rockfish	2
	Silvergray Rockfish	6
	Yelloweye Rockfish	7
2144	Rougheye Rockfish	1
	Silvergray Rockfish	7
	Yellowmouth Rockfish	2
2146	Bocaccio	2
	Redbanded Rockfish	6
	Rougheye Rockfish	27
	Shortraker Rockfish	16
2149	Bocaccio	1
	Silvergray Rockfish	1
	Yelloweye Rockfish	20
2151	Canary Rockfish	1
	Quillback Rockfish	8
	Silvergray Rockfish	2
	Yelloweye Rockfish	13
2152	Quillback Rockfish	6

Station Number *	Species	Total number sampled (2007) *
2154	Yellowtail Rockfish	1
2156	Canary Rockfish	2
	China Rockfish	1
	Quillback Rockfish	19
	Yelloweye Rockfish	8
2157	Rougheye Rockfish	23
	Shortraker Rockfish	7
2158	Quillback Rockfish	7
	Yelloweye Rockfish	1
2160	Redbanded Rockfish	12
2161	Redbanded Rockfish	3
	Silvergray Rockfish	1
2162	Redbanded Rockfish	1
	Rougheye Rockfish	5
2163	Redbanded Rockfish	3
	Silvergray Rockfish	2
2164	Redbanded Rockfish	2
	Rougheye Rockfish	1
	Shortraker Rockfish	4
2165	Rougheye Rockfish	19
	Shortraker Rockfish	1
2166	Rougheye Rockfish	15
	Shortraker Rockfish	1
2167	Bocaccio	1
	Redbanded Rockfish	40
	Silvergray Rockfish	7
	Yelloweye Rockfish	23
2168	Redbanded Rockfish	3
2169	Yelloweye Rockfish	1
2171	Canary Rockfish	1
	Darkblotched Rkfish	1
	Redbanded Rockfish	4
	Silvergray Rockfish	1
	Yelloweye Rockfish	3

* Stations with no rockfish present have been omitted from this list
** on 5 skates of gear

Ketchikan Region:

Station Number *	Total number of Yelloweye sampled (2007) **
3005	92
3013	26
3014	12
3015	10
3016	29
3018	1
3023	4
3024	7
3025	25
3026	7
3029	44
3031	14
3032	4
3033	14
3034	41
3036	5
3038	3
3042	7

Ommaney Region:

Station Number *	Total number of Yelloweye sampled (2007) **
3043	19
3044	1
3046	4
3049	40
3050	12
3051	11
3055	4
3058	40
3059	6
3060	35
3062	36
3063	1
3065	8
3067	21
3072	7
3077	4
3078	9
3079	6
3080	1
3082	2

Sitka Region:

Station Number *	Total number of Yelloweye sampled (2007) **
3083	9
3084	102
3085	11
3086	26
3087	1
3089	4
3092	57
3097	4
3098	3
3102	15
3103	11
3106	10
3108	4
3110	7
3113	12

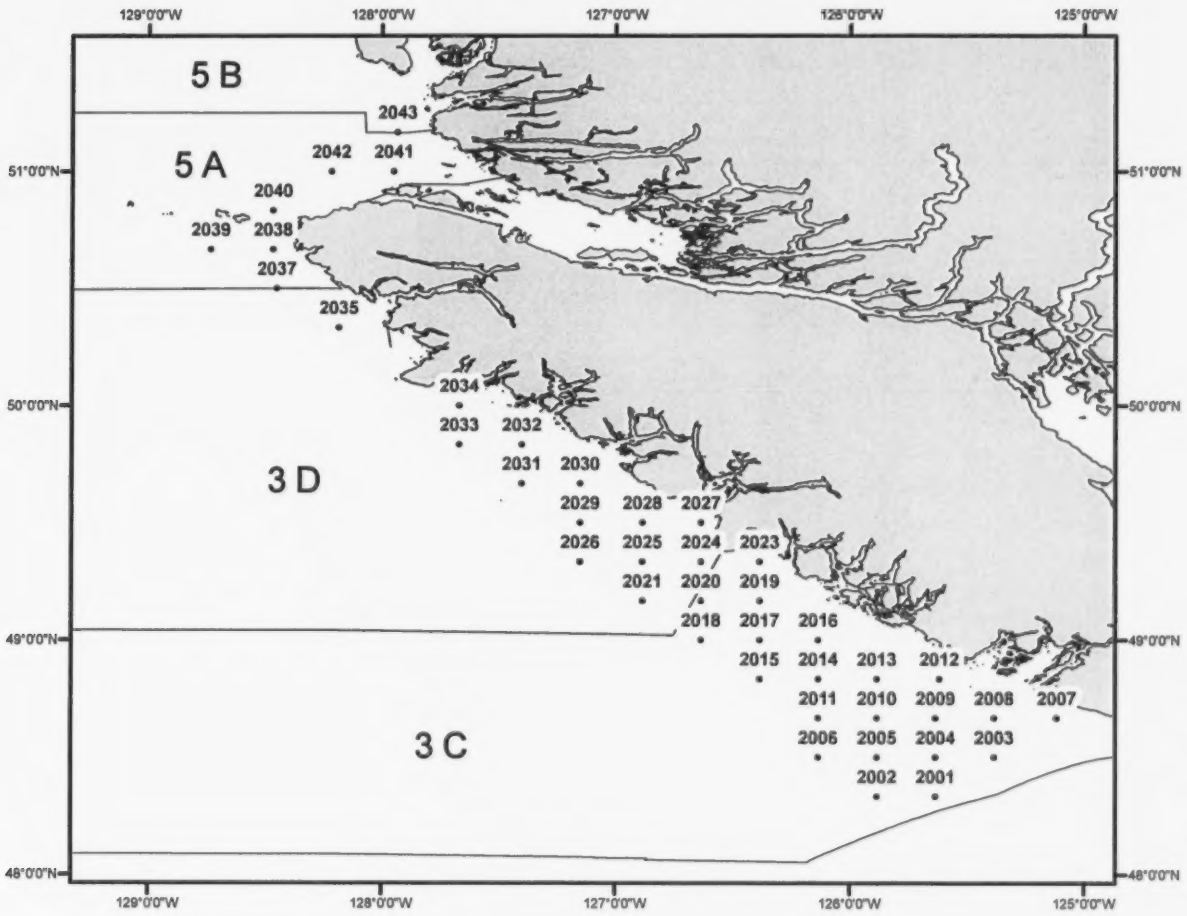
Fairweather Region:

Station Number *	Total number of Yelloweye sampled (2007) **
4004	6
4007	4
4011	7
4012	7
4018	21
4019	19
4025	3
4026	2
4027	13
4031	4
4040	3
4042	1

* Stations with no Yelloweye present have been omitted from this list
** on 5 skates of gear

APPENDIX 3: IPHC STATIONS BY DFO AREA

Vancouver Stations



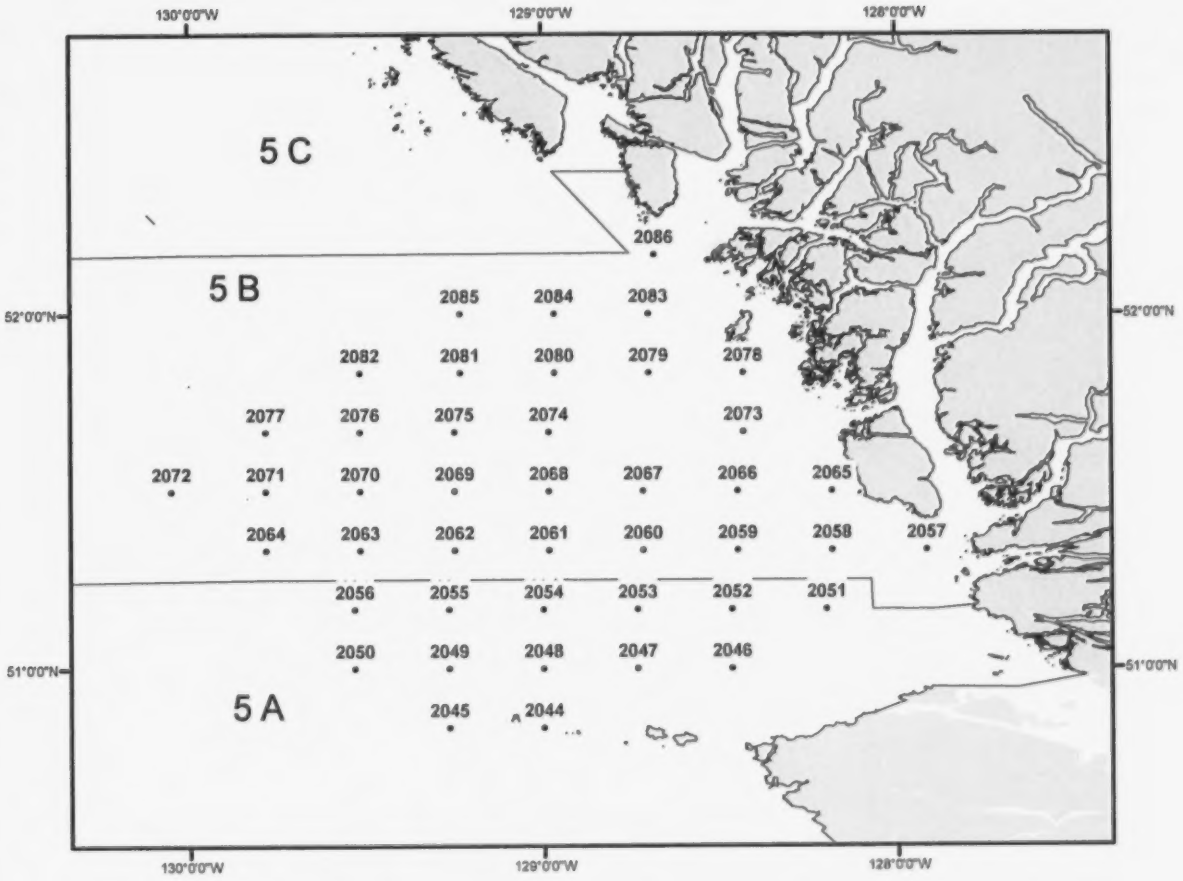
IPHC Station Number	DFO Area
2001	3C
2002	3C
2003	3C
2004	3C
2005	3C
2006	3C
2007	3C
2008	3C
2009	3C
2010	3C
2011	3C
2012	3C
2013	3C
2014	3C

IPHC Station Number	DFO Area
2015	3C
2016	3C
2017	3C
2018	3C
2019	3C
2020	3C
2021	3D
2023	3C
2024	3D
2025	3D
2026	3D
2027	3D
2028	3D
2029	3D

IPHC Station Number	DFO Area
2030	3D
2031	3D
2032	3D
2033	3D
2034	3D
2035	3D
2037	3D
2038	5A
2039	5A
2040	5A
2041	5A
2042	5A
2043	5B

Appendix 3: IPHC stations byDFO area

Goose Island Stations



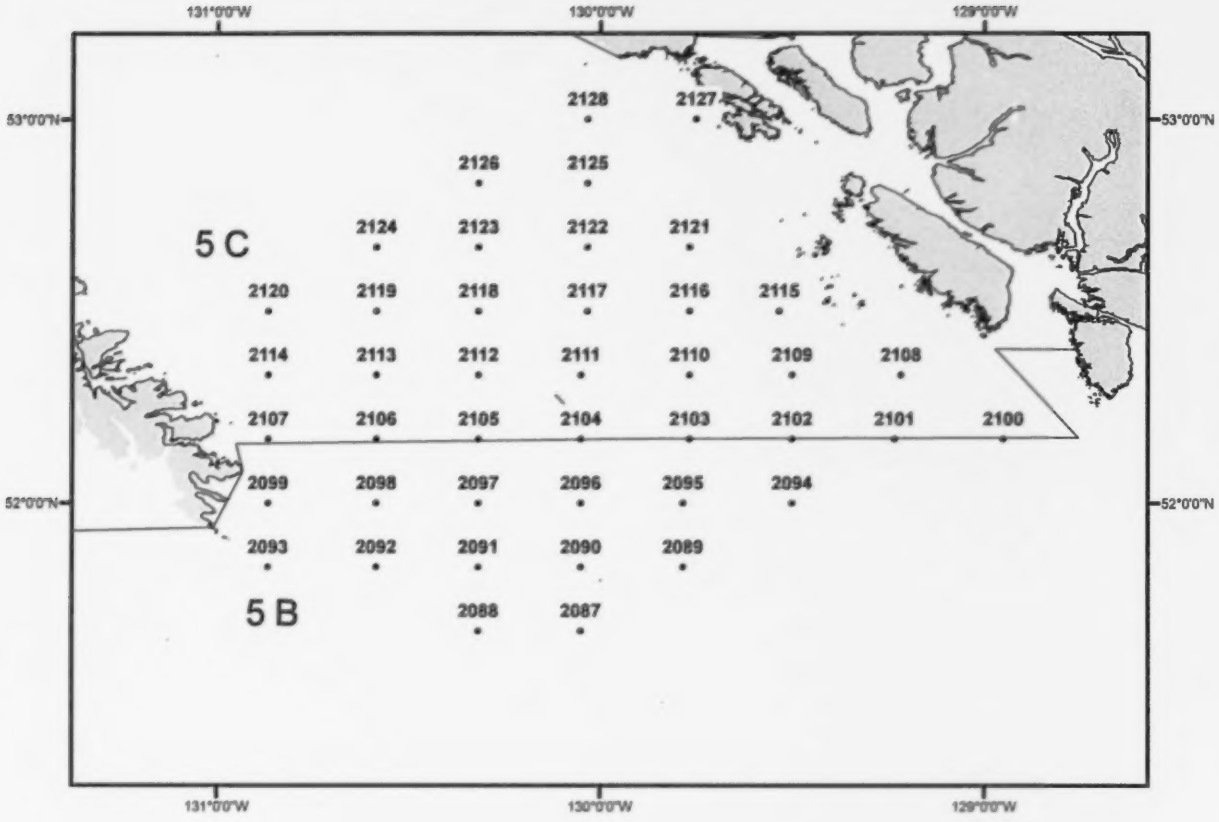
IPHC Station Number	DFO Area
2044	5A
2045	5A
2046	5A
2047	5A
2048	5A
2049	5A
2050	5A
2051	5A
2052	5A
2053	5A
2054	5A
2055	5A
2056	5A
2057	5B
2058	5B

IPHC Station Number	DFO Area
2059	5B
2060	5B
2061	5B
2062	5B
2063	5B
2064	5B
2065	5B
2066	5B
2067	5B
2068	5B
2069	5B
2070	5B
2071	5B
2072	5B

IPHC Station Number	DFO Area
2073	5B
2074	5B
2075	5B
2076	5B
2077	5B
2078	5B
2079	5B
2080	5B
2081	5B
2082	5B
2083	5B
2084	5B
2085	5B
2086	5B

Appendix 3: IPHC stations byDFO area

St. James Stations



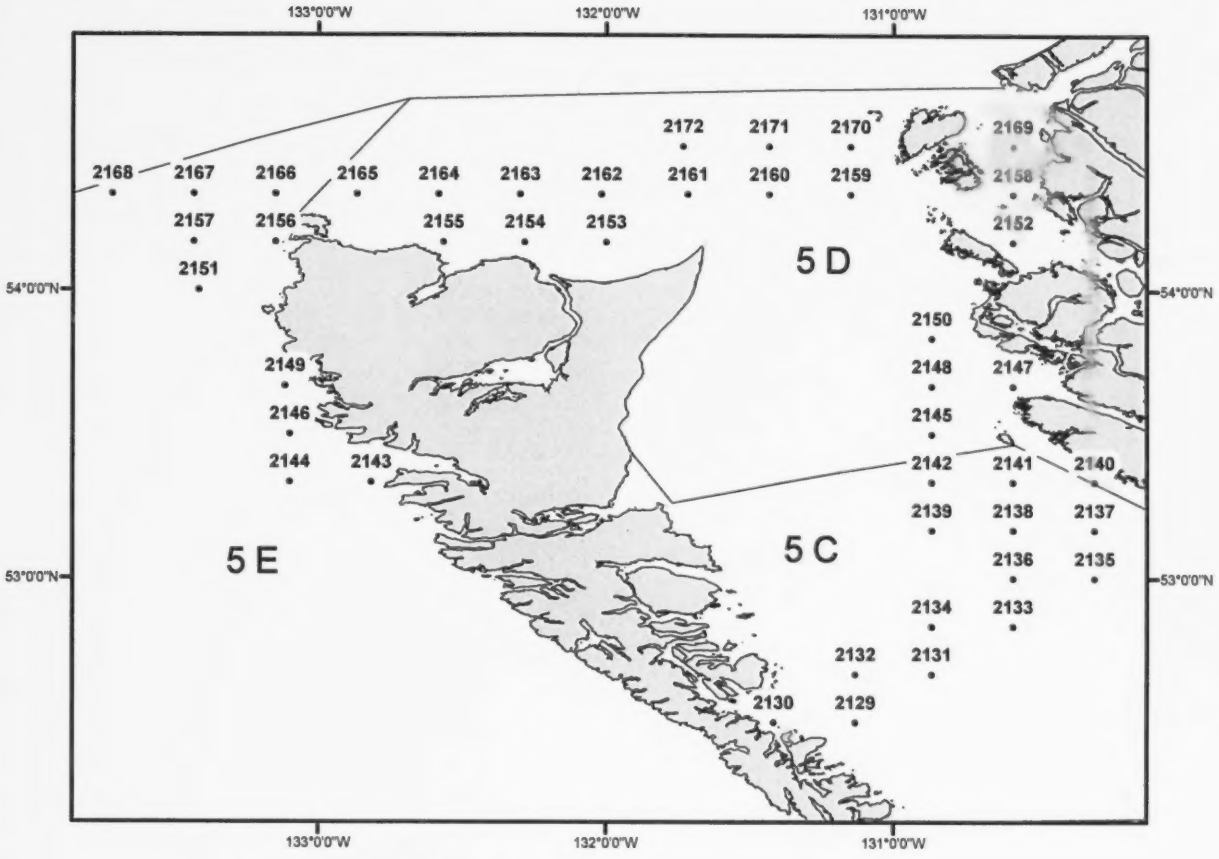
IPHC Station Number	DFO Area
2087	5B
2088	5B
2089	5B
2090	5B
2091	5B
2092	5B
2093	5B
2094	5B
2095	5B
2096	5B
2097	5B
2098	5B
2099	5B
2100	5B

IPHC Station Number	DFO Area
2101	5B
2102	5B
2103	5B
2104	5C
2105	5C
2106	5C
2107	5C
2108	5C
2109	5C
2110	5C
2111	5C
2112	5C
2113	5C
2114	5C

IPHC Station Number	DFO Area
2115	5C
2116	5C
2117	5C
2118	5C
2119	5C
2120	5C
2121	5C
2122	5C
2123	5C
2124	5C
2125	5C
2126	5C
2127	5C
2128	5C

Appendix 3: IPHC stations byDFO area

Charlotte Stations



IPHC Station Number	DFO Area
2044	5A
2045	5A
2046	5A
2047	5A
2048	5A
2049	5A
2050	5A
2051	5A
2052	5A
2053	5A
2054	5A
2055	5A
2056	5A
2057	5B
2058	5B

IPHC Station Number	DFO Area
2059	5B
2060	5B
2061	5B
2062	5B
2063	5B
2064	5B
2065	5B
2066	5B
2067	5B
2068	5B
2069	5B
2070	5B
2071	5B
2072	5B

IPHC Station Number	DFO Area
2073	5B
2074	5B
2075	5B
2076	5B
2077	5B
2078	5B
2079	5B
2080	5B
2081	5B
2082	5B
2083	5B
2084	5B
2085	5B
2086	5B

Appendix 3: IPHC stations byDFO area

Appendix B. Summary of set specifications by vessel, including set number, IPHC station number, date, location (start and end latitudes and longitudes in degrees, decimal minutes), depths (minimum, maximum and average in metres) and times (end deployment and begin retrieval).

Vessel PROUD VENTURE

Set	Station	Date	Start Lat	Start Lon	End Lat	End Lon	Min Depth (m)	Max Depth (m)	Avg. Depth (m)	End Deployment	Begin Retrieval
1	2003	28-May-08	48° 30.81'	125° 22.99'	48° 29.35'	125° 23.05'	78	82	80	5:02 am	3:56 pm
2	2001	28-May-08	48° 19.24'	125° 37.98'	48° 20.73'	125° 37.99'	76	78	77	7:11 am	12:46 pm
3	2004	28-May-08	48° 29.98'	125° 36.75'	48° 30.01'	125° 39.04'	53	72	62	8:50 am	6:39 pm
4	2002	28-May-08	48° 19.98'	125° 51.33'	48° 19.99'	125° 53.53'	100	250	175	10:54 am	10:05 pm
5	2005	29-May-08	48° 30.08'	125° 51.72'	48° 30'	125° 54.02'	56	59	57	5:38 am	11:48 am
6	2006	29-May-08	48° 29.99'	126° 6.61'	48° 29.99'	126° 8.66'	61	76	68	7:02 am	2:28 pm
7	2011	29-May-08	48° 39.99'	126° 8.82'	48° 40.01'	126° 6.58'	74	81	77	8:43 am	5:22 pm
8	2010	29-May-08	48° 39.99'	125° 54.29'	48° 39.97'	125° 52.15'	39	44	41	9:59 am	7:41 pm
9	2009	30-May-08	48° 40'	125° 39.34'	48° 39.99'	125° 37.33'	49	79	64	5:04 am	11:15 am
10	2008	30-May-08	48° 39.99'	125° 24.05'	48° 39.99'	125° 21.91'	33	37	35	6:32 am	1:58 pm
11	2007	30-May-08	48° 39.99'	125° 8.02'	48° 40'	125° 5.93'	32	36	34	8:05 am	2:39 pm
12	2012	31-May-08	48° 50'	125° 35.8'	48° 50'	125° 38.11'	23	27	25	5:11 am	1:03 pm
13	2013	31-May-08	48° 49.99'	125° 51.87'	48° 50'	125° 54.14'	31	35	33	6:37 am	3:56 pm
14	2014	31-May-08	48° 49.99'	126° 6.92'	48° 50'	126° 9.18'	56	63	59	7:59 am	6:29 pm
15	2016	31-May-08	48° 59.99'	126° 9.24'	48° 59.99'	126° 7.07'	38	41	39	9:40 am	9:12 pm
16	2019	01-Jun-08	49° 10.01'	126° 20.93'	49° 9.99'	126° 23.15'	42	47	44	5:10 am	11:38 am
17	2023	01-Jun-08	49° 19.99'	126° 22.04'	49° 19.99'	126° 24.3'	21	22	21	6:47 am	2:18 pm
18	2024	01-Jun-08	49° 20.01'	126° 37.01'	49° 19.98'	126° 39.25'	34	48	41	8:10 am	4:48 pm
19	2020	01-Jun-08	49° 10'	126° 38.87'	49° 9.99'	126° 36.7'	68	70	69	9:46 am	7:54 pm
20	2017	02-Jun-08	48° 59.98'	126° 22.26'	48° 59.99'	126° 24.54'	76	79	77	5:10 am	10:23 am
21	2018	02-Jun-08	48° 59.99'	126° 36.9'	49° 0'	126° 39.08'	111	140	125	6:29 am	12:57 pm
22	2015	02-Jun-08	48° 50.04'	126° 23.62'	48° 50.02'	126° 21.38'	97	100	98	8:43 am	4:29 pm
23	2021	05-Jun-08	49° 9.37'	126° 52.98'	49° 10.69'	126° 53'	92	99	95	6:03 am	8:56 pm
24	2026	05-Jun-08	49° 19.43'	127° 8.98'	49° 20.78'	127° 9.02'	99	104	101	8:26 am	12:52 am
25	2025	06-Jun-08	49° 20.01'	126° 54.12'	49° 20.01'	126° 51.83'	74	79	76	5:18 am	10:20 am
26	2027	06-Jun-08	49° 29.17'	126° 38'	49° 30.54'	126° 37.89'	22	23	22	7:29 am	1:52 pm
27	2028	07-Jun-08	49° 29.99'	126° 52.04'	49° 30'	126° 54.02'	47	55	51	5:31 am	11:39 am
28	2029	07-Jun-08	49° 30'	127° 8.03'	49° 30'	127° 10.08'	80	82	81	7:32 am	2:43 pm
29	2030	07-Jun-08	49° 39.99'	127° 10'	49° 39.99'	127° 7.81'	61	64	62	9:27 am	5:40 pm
30	2031	08-Jun-08	49° 40'	127° 23'	49° 40.01'	127° 24.97'	90	180	135	5:01 am	1:15 pm
31	2032	08-Jun-08	49° 50.01'	127° 22.87'	49° 49.99'	127° 25.07'	42	45	43	6:43 am	4:17 pm
32	2033	08-Jun-08	49° 50'	127° 38.59'	49° 50'	127° 40.79'	85	100	92	8:13 am	6:52 pm
33	2034	08-Jun-08	50° 0'	127° 40.98'	49° 59.99'	127° 38.82'	45	51	48	9:55 am	9:41 pm
34	2035	09-Jun-08	50° 20.73'	128° 11'	50° 19.34'	128° 11.02'	86	92	89	5:04 am	10:07 am
35	2037	11-Jun-08	50° 29.99'	128° 25.95'	50° 30'	128° 28.07'	102	104	103	5:11 am	2:30 pm
36	2039	11-Jun-08	50° 40.01'	128° 44.89'	50° 40'	128° 42.62'	101	108	104	8:03 am	5:55 pm
37	2038	11-Jun-08	50° 39.99'	128° 29.2'	50° 39.92'	128° 26.83'	44	51	47	9:25 am	8:30 pm
38	2040	11-Jun-08	50° 50.64'	128° 28.02'	50° 49.08'	128° 28.02'	31	39	35	11:44 am	11:44 pm
39	2047	12-Jun-08	51° 0'	128° 42.63'	50° 59.99'	128° 45.06'	35	38	36	5:15 am	10:55 am
40	2052	12-Jun-08	51° 10.01'	128° 28.83'	51° 10'	128° 26.42'	107	108	107	7:22 am	2:12 pm
41	2046	12-Jun-08	51° 0.01'	128° 27.06'	50° 59.99'	128° 29.24'	48	55	51	9:15 am	5:43 pm
42	2048	15-Jun-08	50° 59.98'	128° 59.05'	51° 0.01'	129° 1.35'	44	47	45	5:01 am	11:33 am
43	2044	15-Jun-08	50° 49.98'	128° 58.91'	50° 50.5'	129° 1.37'	44	49	46	6:48 am	2:08 pm
44	2045	15-Jun-08	50° 49.99'	129° 14.95'	50° 49.99'	129° 17.11'	61	72	66	8:19 am	4:40 pm

Appendix B continued on next page.

Vessel PROUD VENTURE

Set	Station	Date	Start Lat	Start Lon	End Lat	End Lon	Min Depth (m)	Max Depth (m)	Avg. Depth (m)	End Deployment	Begin Retrieval
45	2049	15-Jun-08	50° 59.99'	129° 17.07'	50° 59.99'	129° 14.77'	85	89	87	10:04 am	7:34 pm
46	2054	16-Jun-08	51° 9.99'	129° 1.11'	51° 10.01'	128° 59'	72	75	73	5:01 am	11:28 am
47	2053	16-Jun-08	51° 10.02'	128° 45.06'	51° 10'	128° 42.95'	54	56	55	6:35 am	2:35 pm
48	2060	16-Jun-08	51° 19.99'	128° 41.95'	51° 20.03'	128° 44.16'	112	116	114	8:17 am	5:21 pm
49	2061	16-Jun-08	51° 20'	128° 57.93'	51° 20.01'	129° 0.2'	134	137	135	9:40 am	8:17 pm
50	2062	17-Jun-08	51° 19.99'	129° 16.04'	51° 20'	129° 13.96'	127	131	129	5:08 am	11:45 pm
51	2055	17-Jun-08	51° 10.73'	129° 16.01'	51° 9.32'	129° 15.99'	131	163	147	6:43 am	12:20 pm
52	2056	17-Jun-08	51° 10.67'	129° 32.01'	51° 9.24'	129° 32'	154	156	155	8:23 am	3:22 pm
53	2050	17-Jun-08	51° 0.68'	129° 31.99'	50° 59.26'	129° 32'	130	140	135	9:49 am	7:06 pm
54	2076	18-Jun-08	51° 39.25'	129° 31'	51° 40.73'	129° 31'	52	54	53	6:19 am	2:19 pm
55	2077	18-Jun-08	51° 40.63'	129° 47.1'	51° 39.27'	129° 47.03'	111	160	135	8:10 am	5:13 pm
56	2072	18-Jun-08	51° 29.55'	130° 2.96'	51° 31.06'	130° 2.98'	132	178	155	10:47 am	8:56 pm
57	2067	19-Jun-08	51° 30'	128° 44.19'	51° 30'	128° 42.02'	29	58	43	6:20 am	12:07 pm
58	2066	19-Jun-08	51° 30.61'	128° 27.01'	51° 29.11'	128° 27'	102	104	103	8:07 am	2:44 pm
59	2059	19-Jun-08	51° 20.59'	128° 26.98'	51° 19.02'	128° 26.98'	77	85	81	9:34 am	5:05 pm
60	2065	20-Jun-08	51° 30.71'	128° 11'	51° 29.3'	128° 10.99'	42	48	45	7:57 am	1:29 pm
61	2058	20-Jun-08	51° 20.67'	128° 11'	51° 19.26'	128° 10.99'	37	59	48	9:32 am	4:10 pm
62	2057	20-Jun-08	51° 19.47'	127° 54.99'	51° 21.03'	127° 55.03'	70	79	74	11:15 am	6:49 pm
63	2043	21-Jun-08	51° 10.52'	127° 56'	51° 9.07'	127° 56'	66	72	69	5:22 am	11:37 am
64	2051	21-Jun-08	51° 10'	128° 10.99'	51° 10'	128° 13.48'	52	61	56	6:47 am	2:17 pm
65	2042	21-Jun-08	51° 0.68'	128° 12.99'	50° 59.11'	128° 13.01'	43	65	54	8:13 am	4:51 pm
66	2041	21-Jun-08	50° 59.41'	127° 56.98'	51° 0.83'	127° 56.99'	37	70	53	10:00 am	7:31 pm
67	2063	24-Jun-08	51° 19.22'	129° 31.03'	51° 20.68'	129° 31'	105	118	111	5:30 am	12:32 pm
68	2070	24-Jun-08	51° 30.67'	129° 31.03'	51° 29.17'	129° 31.02'	53	56	54	7:30 am	3:30 pm
69	2071	24-Jun-08	51° 30.67'	129° 47.02'	51° 29.3'	129° 47'	91	95	93	9:20 am	7:02 pm
70	2064	24-Jun-08	51° 20.62'	129° 47.01'	51° 19.24'	129° 46.98'	130	136	133	10:55 am	10:03 pm
71	2069	25-Jun-08	51° 30'	129° 17.2'	51° 30.01'	129° 14.86'	27	29	28	5:10 am	11:48 am
72	2068	25-Jun-08	51° 29.99'	129° 0.17'	51° 29.99'	128° 57.79'	25	27	26	6:45 am	2:51 pm
73	2074	25-Jun-08	51° 39.22'	128° 59.03'	51° 40.57'	128° 59'	27	32	29	7:30 am	5:31 pm
74	2075	25-Jun-08	51° 40.7'	129° 16.02'	51° 39.25'	129° 16.02'	28	32	30	10:20 am	8:38 pm
75	2082	26-Jun-08	51° 49.43'	129° 31.03'	51° 50.93'	129° 31.01'	139	141	140	6:00 am	12:55 pm
76	2085	26-Jun-08	51° 59.37'	129° 14'	52° 0.76'	129° 14.04'	99	100	99	8:20 am	4:47 pm
77	2081	26-Jun-08	51° 50.67'	129° 14.07'	51° 49.31'	129° 14.02'	67	68	67	10:50 am	8:00 pm
78	2078	27-Jun-08	51° 49.37'	128° 26'	51° 50.79'	128° 26.02'	89	94	91	5:15 am	12:24 pm
79	2073	27-Jun-08	51° 39.39'	128° 26.01'	51° 40.8'	128° 26.01'	79	81	80	7:50 am	3:27 pm
80	2079	27-Jun-08	51° 50.67'	128° 42.03'	51° 49.19'	128° 42.02'	43	66	54	10:30 am	7:07 pm
81	2080	28-Jun-08	51° 49.02'	128° 58'	51° 50.76'	128° 58.04'	44	47	45	5:00 am	1:19 pm
82	2084	28-Jun-08	51° 59.34'	128° 58.02'	52° 0.89'	128° 58'	70	94	82	6:30 am	4:03 pm
83	2083	28-Jun-08	51° 59.28'	128° 42.01'	52° 0.73'	128° 42.02'	89	94	91	8:15 am	6:45 pm
84	2086	28-Jun-08	52° 9.33'	128° 41'	52° 10.79'	128° 41.02'	106	130	118	9:35 am	9:34 pm

Appendix B continued on next page.

Vessel STAR WARS II

Set	Station	Date	Start Lat	Start Lon	End Lat	End Lon	Min Depth (m)	Max Depth (m)	Avg. Depth (m)	End Deployment	Begin Retrieval
1	2091	15-Jul-08	51° 50.68'	130° 18.98'	51° 49.27'	130° 19'	113	117	115	5:02 am	10:43 am
2	2090	15-Jul-08	51° 50.63'	130° 3'	51° 49.23'	130° 3'	94	101	97	6:34 am	1:27 pm
3	2087	15-Jul-08	51° 40.62'	130° 2.99'	51° 39.25'	130° 3.01'	189	191	190	7:45 am	4:17 pm
4	2088	15-Jul-08	51° 39.4'	130° 19'	51° 40.91'	130° 18.99'	132	149	140	9:18 am	7:14 pm
5	2098	16-Jul-08	52° 0.57'	130° 34.99'	51° 58.95'	130° 35'	123	164	143	5:00 am	10:50 am
6	2092	16-Jul-08	51° 50.74'	130° 35'	51° 49.3'	130° 35'	159	162	160	6:12 am	1:46 pm
7	2093	16-Jul-08	51° 50.6'	130° 52.01'	51° 49.14'	130° 52'	95	109	102	7:43 am	5:00 pm
8	2099	16-Jul-08	51° 59.29'	130° 52'	52° 0.79'	130° 52'	87	119	103	9:18 am	8:40 pm
9	2105	17-Jul-08	52° 10.84'	130° 19'	52° 9.38'	130° 19'	211	223	217	5:00 am	10:15 am
10	2104	17-Jul-08	52° 10.81'	130° 3'	52° 9.26'	130° 3'	85	90	87	6:31 am	1:16 pm
11	2096	17-Jul-08	52° 0.8'	130° 3'	51° 59.47'	130° 3'	75	76	75	7:41 am	4:00 pm
12	2097	17-Jul-08	51° 59.39'	130° 19'	52° 0.97'	130° 19'	189	192	190	9:02 am	6:51 pm
13	2103	18-Jul-08	52° 10.67'	129° 46'	52° 9.1'	129° 45.99'	103	114	108	5:00 am	11:05 am
14	2095	18-Jul-08	52° 0.87'	129° 47.01'	51° 59.38'	129° 47'	60	63	61	6:12 am	1:54 pm
15	2089	18-Jul-08	51° 50.77'	129° 47'	51° 49.28'	129° 47'	125	151	138	7:30 am	4:33 pm
16	2094	18-Jul-08	51° 59.27'	129° 30'	52° 0.69'	129° 30'	100	113	110	9:28 am	7:41 pm
17	2113	19-Jul-08	52° 20.02'	130° 35'	° '	° '				12:00 am	12:00 am
18	2106	19-Jul-08	52° 10.72'	130° 35'	52° 9.18'	130° 35'	102	106	104	6:27 am	1:59 pm
19	2107	19-Jul-08	52° 10.64'	130° 52'	52° 9.05'	130° 52'	119	122	120	8:07 am	4:53 pm
20	2114	19-Jul-08	52° 19.2'	130° 52'	52° 20.71'	130° 52'	75	81	78	9:35 am	8:13 pm
21	2126	20-Jul-08	52° 50.69'	130° 19'	52° 49.17'	130° 19'	113	115	114	5:00 am	12:45 pm
22	2125	20-Jul-08	52° 50.81'	130° 2'	52° 49.34'	130° 2'	140	140	140	6:37 am	3:26 pm
23	2128	20-Jul-08	53° 0.72'	130° 1.99'	52° 59.18'	130° 2'	87	115	101	8:20 am	6:17 pm
24	2127	20-Jul-08	53° 0.69'	129° 44.99'	52° 59.28'	129° 45'	50	137	93	9:46 am	9:00 pm
25	2143	23-Jul-08	53° 20.81'	132° 48.99'	53° 19.35'	132° 49'	74	81	77	6:00 am	12:33 pm
26	2144	23-Jul-08	53° 19.4'	133° 5.99'	53° 20.85'	133° 6'	116	149	132	7:23 am	3:11 pm
27	2146	23-Jul-08	53° 29.29'	133° 6'	53° 30.71'	133° 6'	163	274	218	8:34 am	5:51 pm
28	2149	23-Jul-08	53° 40.76'	133° 6.99'	53° 39.29'	133° 7'	76	82	79	9:56 am	8:53 pm
29	2164	24-Jul-08	54° 19.23'	132° 35'	54° 20.61'	132° 34.98'	141	150	145	5:00 am	10:17 am
30	2163	24-Jul-08	54° 20.65'	132° 18'	54° 19.23'	132° 18'	116	131	123	6:22 am	1:04 pm
31	2154	24-Jul-08	54° 10.68'	132° 17.01'	54° 9.34'	132° 17'	44	56	50	7:34 am	3:50 pm
32	2155	24-Jul-08	54° 9.41'	132° 34.01'	54° 10.94'	132° 34'	42	52	47	8:56 am	6:20 pm
33	2156	25-Jul-08	54° 9.33'	133° 9'	54° 10.76'	133° 9.02'	32	46	39	6:30 am	12:01 pm
34	2166	25-Jul-08	54° 19.49'	133° 8.98'	54° 20.86'	133° 8.97'	247	250	248	7:48 am	2:50 pm
35	2165	25-Jul-08	54° 20.72'	132° 52'	54° 19.41'	132° 52'	209	213	211	9:40 am	5:55 pm
36	2151	26-Jul-08	53° 59.3'	133° 25'	54° 0.64'	133° 25'	39	45	42	5:01 am	12:00 pm
37	2157	26-Jul-08	54° 9.31'	133° 26'	54° 10.73'	133° 26'	214	215	214	6:14 am	2:29 pm
38	2167	26-Jul-08	54° 19.27'	133° 25.99'	54° 20.65'	133° 26.01'	113	127	120	7:28 am	8:50 pm
39	2168	26-Jul-08	54° 20.61'	133° 43.03'	54° 19.23'	133° 43'	132	136	134	8:58 am	6:01 pm
40	2153	27-Jul-08	54° 9.25'	132° 0'	54° 10.7'	132° 0'	25	46	35	5:00 am	11:44 am
41	2162	27-Jul-08	54° 19.44'	132° 1.01'	54° 20.94'	132° 0'	130	139	134	6:13 am	2:20 pm
42	2161	27-Jul-08	54° 19.29'	131° 43'	54° 20.71'	131° 43'	101	104	102	7:41 am	5:15 pm
43	2172	27-Jul-08	54° 29.34'	131° 44.01'	54° 30.73'	131° 44'	183	186	184	8:54 am	7:53 pm
44	2169	28-Jul-08	54° 30.66'	130° 34.99'	54° 29.16'	130° 35'	55	72	63	5:00 am	10:19 am

Appendix B continued on next page.

Vessel STAR WARS II

Set	Station	Date	Start Lat	Start Lon	End Lat	End Lon	Min Depth (m)	Max Depth (m)	Avg. Depth (m)	End Deployment	Begin Retrieval
45	2158	28-Jul-08	54° 20.77'	130° 35'	54° 19.29'	130° 35'	36	67	51	6:10 am	12:40 pm
46	2152	28-Jul-08	54° 9.33'	130° 34.99'	54° 10.79'	130° 35'	48	68	58	7:38 am	3:01 pm
47	2100	01-Aug-08	52° 10.72'	128° 57'	52° 9.21'	128° 57.01'	79	91	85	5:00 am	12:25 pm
48	2101	01-Aug-08	52° 10.67'	129° 13.98'	52° 9.24'	129° 14'	92	93	92	6:39 am	3:07 pm
49	2102	01-Aug-08	52° 10.66'	129° 30'	52° 9.14'	129° 30'	112	114	113	8:10 am	5:38 pm
50	2108	01-Aug-08	52° 19.28'	129° 13'	52° 20.81'	129° 12.99'	77	84	80	10:16 am	8:44 pm
51	2115	02-Aug-08	52° 30.66'	129° 32.01'	52° 29.09'	129° 32.01'	50	61	55	5:00 am	10:32 am
52	2116	02-Aug-08	52° 30.62'	129° 46.01'	52° 29.05'	129° 46'	92	101	96	6:22 am	1:28 pm
53	2110	02-Aug-08	52° 20.75'	129° 46'	52° 19.26'	129° 46'	112	114	113	7:30 am	4:15 pm
54	2109	02-Aug-08	52° 20.74'	129° 30.01'	52° 19.31'	129° 30'	87	97	92	9:03 am	7:14 pm
55	2121	03-Aug-08	52° 40.62'	129° 46'	52° 39.09'	129° 46'	99	107	103	5:00 am	11:40 am
56	2122	03-Aug-08	52° 40.65'	130° 2'	52° 39.04'	130° 2.01'	143	144	143	6:31 am	2:23 pm
57	2117	03-Aug-08	52° 30.86'	130° 2'	52° 29.33'	130° 2'	144	148	146	7:34 am	4:58 pm
58	2111	03-Aug-08	52° 20.81'	130° 3'	52° 19.38'	130° 3'	117	132	124	8:42 am	7:47 pm
59	2123	04-Aug-08	52° 40.74'	130° 19'	52° 39.14'	130° 19'	121	124	122	5:00 am	11:43 am
60	2118	04-Aug-08	52° 30.7'	130° 19'	52° 29.13'	130° 19'	131	146	138	6:09 am	2:29 pm
61	2112	04-Aug-08	52° 20.67'	130° 19'	52° 19.16'	130° 19'	187	194	190	7:14 am	5:12 pm
62	2119	04-Aug-08	52° 30.72'	130° 35'	52° 29.19'	130° 35.01'	64	68	66	9:36 am	8:36 pm
63	2120	05-Aug-08	52° 29.24'	130° 52'	52° 30.69'	130° 52'	58	61	59	5:01 am	12:12 pm
64	2129	05-Aug-08	52° 30.67'	131° 7.96'	52° 29.13'	131° 8'	35	73	54	6:30 am	2:35 pm
65	2130	05-Aug-08	52° 30.7'	131° 25'	52° 29.23'	131° 25'	53	130	91	8:05 am	5:02 pm
66	2132	05-Aug-08	52° 40.62'	131° 8'	52° 39.05'	131° 8.01'	35	42	38	10:19 am	10:04 pm
67	2124	06-Aug-08	52° 39.35'	130° 35'	52° 40.78'	130° 35.01'	79	87	83	5:00 am	11:02 am
68	2131	06-Aug-08	52° 39.41'	130° 52'	52° 4[illegible].76'	130° 52'	51	54	52	6:30 am	1:45 pm
69	2134	06-Aug-08	52° 50.75'	130° 52'	52° 49.18'	130° 52'	26	30	28	8:00 am	3:51 pm
70	2133	06-Aug-08	52° 50.65'	130° 34.99'	52° 48.96'	130° 35'	60	65	62	9:31 am	6:30 pm
71	2136	07-Aug-08	52° 59.11'	130° 35'	53° 0.63'	130° 35'	50	53	51	5:03 am	11:59 am
72	2135	07-Aug-08	52° 59.25'	130° 18'	53° 0.68'	130° 18'	114	115	114	6:33 am	2:29 pm
73	2137	07-Aug-08	53° 9.25'	130° 18'	53° 10.62'	130° 18'	59	118	88	7:44 am	5:01 pm
74	2140	07-Aug-08	53° 20.67'	130° 18'	53° 19.26'	130° 18'	50	62	56	9:08 am	8:09 pm
75	2159	09-Aug-08	54° 20.73'	131° 9'	54° 19.21'	131° 9'	33	37	35	5:00 am	10:21 am
76	2160	09-Aug-08	54° 20.77'	131° 26'	54° 19.32'	131° 26'	91	102	96	6:25 am	12:51 pm
77	2171	09-Aug-08	54° 29.19'	131° 26'	54° 30.61'	131° 26'	38	78	58	7:43 am	3:29 pm
78	2170	09-Aug-08	54° 30.78'	131° 9'	54° 29.37'	131° 9.01'	73	81	77	9:06 am	6:27 pm
79	2148	10-Aug-08	53° 40.83'	130° 52'	53° 39.29'	130° 52'	25	28	26	6:05 am	1:36 pm
80	2145	10-Aug-08	53° 30.81'	130° 52'	53° 29.36'	130° 52.01'	50	54	52	7:17 am	3:54 pm
81	2139	10-Aug-08	53° 9.26'	130° 51.99'	53° 10.72'	130° 52'	57	58	57	9:54 am	8:43 pm
82	2142	10-Aug-08	53° 19.2'	130° 52'	53° 20.66'	130° 52'	71	75	73	11:03 am	6:22 pm
83	2138	11-Aug-08	53° 9.28'	130° 35.01'	53° 10.79'	130° 35.01'	100	106	103	5:00 am	10:02 am
84	2141	11-Aug-08	53° 19.23'	130° 35'	53° 20.75'	130° 35.01'	32	53	42	6:19 am	12:53 pm
85	2147	12-Aug-08	53° 40.82'	130° 35'	53° 39.38'	130° 35'	16	22	19	5:02 am	10:09 am
86	2150	12-Aug-08	53° 49.18'	130° 52.01'	53° 50.69'	130° 52'	43	52	47	7:00 am	1:07 pm

Appendix C. Set information by PFMSC area, common IPHC station and year (2003 to 2008), showing number of hooks deployed, returned, with bait, empty, or with catch, separated for Pacific Halibut, North Pacific Spiny Dogfish, Redbanded Rockfish, Yelloweye Rockfish, Rougheye Rockfish, and Quillback Rockfish, with catch per 100 hooks shown for rockfish.

Hkd # Hooks deployed
Hko # Hooks observed/returned
Nb # Hooks with bait left intact
Ne # Hooks empty/bait skin
No # other catch (fish/invert./inanimate)
614 # Pacific Halibut
044 # North Pacific Spiny Dogfish
401 # Redbanded Rockfish, catch per 100 Hooks
442 # Yelloweye Rockfish, catch per 100 Hooks
394 # Rougheye Rockfish, catch per 100 Hooks
424 # Quillback Rockfish, catch per 100 Hooks

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
3C/D, 5A																		
	2001	2003	5	800	800	0	479	30	9	282	0		0		0		0	
		2004	5	789	788	0	546	83	48	111	0		0		0		0	
		2005	5	694	688	0	154	3	0	533	0		0		0		0	
		2006	5	597	596	0	360	6	0	230	0		0		0		0	
		2007	2	501	501	0	291	0	6	204	0		0		0		0	
		2008	2	501	499	2	328	2	3	164	0		0		0		0	
	2002	2003	6	798	798	12	575	180	6	20	4	0.5	0		0		0	
		2004	6	788	779	46	495	183	19	1	15	1.93	0		20	2.57	0	
		2005	6	700	687	36	397	217	7	5	1	0.15	0		24	3.49	0	
		2006	4	500	483	3	315	46	6	113	0		0		0		0	
		2007	3	501	495	40	306	117	6	21	0		0		6	1.21	0	
		2008	4	504	498	12	295	117	13	60	1	0.2	0		0		0	
	2003	2003	3	796	796	0	606	12	3	175	0		0		0		0	
		2004	2	790	788	3	443	34	0	308	0		0		0		0	
		2005	3	700	699	1	518	8	1	164	0		0		0		0	
		2006	3	600	595	1	445	2	2	145	0		0		0		0	
		2007	1	494	494	0	372	3	0	119	0		0		0		0	
		2008	1	493	487	6	266	51	13	154	0		0		0		0	
	2004	2003	4	797	797	0	491	1	2	303	0		0		0		0	
		2004	4	796	796	0	326	4	4	462	0		0		0		0	
		2005	4	703	701	0	289	0	1	413	0		0		0		0	
		2006	6	602	601	0	392	2	36	172	0		0		0		0	
		2007	4	498	498	0	290	2	13	194	0		0		0		0	
		2008	3	499	496	74	176	35	60	151	0		0		0		0	
	2005	2003	8	785	785	4	409	6	12	327	0		27	3.44	0		0	
		2004	7	789	787	17	455	144	47	52	0		72	9.15	0		0	
		2005	7	707	706	0	463	9	2	222	0		10	1.42	0		0	
		2006	7	597	596	2	270	14	55	227	0		28	4.7	0		0	
		2007	5	497	497	4	280	10	13	175	0		15	3.02	0		0	
		2008	5	496	493	92	142	14	59	150	0		36	7.3	0		0	
	2006	2003	7	802	802	2	499	232	16	47	6	0.75	0		0		0	
		2004	8	796	788	213	395	152	23	5	0		0		0		0	
		2005	8	702	689	8	383	254	19	26	0		0		0		0	
		2006	8	604	596	1	407	17	7	164	0		0		0		0	
		2007	6	502	498	12	246	51	52	138	0		1	0.2	0		0	
		2008	6	495	489	2	290	11	9	177	0		1	0.2	0		0	
	2007	2003	1	795	795	6	430	9	7	322	0		7	0.88	0		14	1.76
		2004	3	793	789	4	383	5	3	387	0		5	0.63	0		2	0.25
		2005	1	689	686	60	464	21	63	6	0		18	2.62	0		54	7.87
		2006	1	601	600	87	396	40	29	14	0		3	0.5	0		31	5.17
		2007	9	494	494	135	246	24	26	50	0		1	0.2	0		13	2.63
		2008	11	492	490	114	254	24	18	67	0		8	1.63	0		5	1.02
	2008	2003	2	781	781	15	433	14	27	289	0		0		0		3	0.38
		2004	1	794	791	6	437	2	12	334	0		0		0		0	
		2005	2	690	688	28	391	37	106	65	0		9	1.31	0		52	7.56
		2006	2	600	599	27	443	10	61	45	0		2	0.33	0		11	1.84
		2007	10	500	500	0	396	0	1	102	0		1	0.2	0		0	
		2008	10	504	500	28	204	6	64	186	0		11	2.2	0		1	0.2
	2009	2003	10	806	806	0	652	0	4	150	0		0		0		0	
		2004	11	795	789	1	314	3	1	470	0		0		0		0	
		2005	11	701	701	2	588	3	8	100	0		1	0.14	0		0	
		2006	11	602	601	0	428	3	3	168	0		0		0		0	
		2007	11	499	498	4	375	10	6	103	0		0		0		0	
		2008	9	498	490	57	258	21	9	145	0		0		0		0	
	2010	2003	11	792	792	6	374	1	13	398	0		0		0		0	
		2004	10	796	791	0	447	20	20	304	0		0		0		0	
		2005	10	703	700	14	463	18	76	129	0		0		0		0	
		2006	10	598	593	1	373	9	10	200	0		0		0		0	
		2007	8	498	498	2	365	4	24	103	0		0		0		0	
		2008	8	498	495	164	155	14	77	85	0		0		0		0	
	2011	2003	12	800	800	128	376	5	26	252	0		11	1.38	0		2	0.25

Area (3C/D, 5A)	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
	2011	2004	9	794	792	23	506	212	9	38	2	0.25	2	0.25	0		0	
		2005	9	703	699	0	489	35	1	175	0		0		0		0	
		2006	9	600	600	0	356	6	0	239	0		0		0		0	
		2007	7	502	501	2	270	22	10	198	0		0		0		0	
		2008	7	500	493	1	281	9	13	189	0		0		0		0	
	2012	2003	9	805	805	353	423	1	14	11	0		1	0.12	0		2	0.25
		2004	12	797	792	6	248	3	15	515	0		1	0.13	0		4	0.51
		2005	12	702	700	93	449	33	57	20	0		13	1.86	0		35	5
		2006	12	600	600	170	351	10	42	7	0		2	0.33	0		18	3
		2007	12	490	488	232	195	10	36	10	0		3	0.61	0		4	0.82
		2008	12	494	341	151	138	16	28	1	0		3	0.88	0		6	1.76
	2013	2003	14	803	803	0	490	0	3	310	0		0		0		0	
		2004	13	794	782	1	271	3	5	499	0		2	0.26	0		1	0.13
		2005	13	705	703	62	460	11	75	78	0		12	1.71	0		6	0.85
		2006	13	601	601	87	361	16	44	65	0		11	1.83	0		18	3
		2007	13	499	499	102	220	14	39	119	0		3	0.6	0		3	0.6
		2008	13	496	491	189	232	8	24	28	0		6	1.22	0		4	0.81
	2014	2003	13	803	803	0	408	2	1	392	0		0		0		0	
		2004	14	796	795	30	602	90	3	70	0		0		0		0	
		2005	14	703	701	4	460	2	2	233	0		0		0		0	
		2006	14	603	602	0	385	3	0	214	0		0		0		0	
		2007	14	502	500	0	273	0	0	227	0		0		0		0	
		2008	14	495	492	43	153	25	46	225	0		0		0		0	
	2015	2003	16	798	798	0	624	86	30	57	0		0		0		0	
		2004	15	787	785	53	578	143	5	0	5	0.64	1	0.13	0		0	
		2005	15	700	698	14	426	185	9	43	23	3.3	0		0		0	
		2006	19	597	597	3	444	53	3	89	5	0.84	0		0		0	
		2007	21	499	498	61	289	62	19	66	1	0.2	0		0		0	
		2008	22	497	493	12	263	29	15	174	1	0.2	0		0		0	
	2016	2003	15	804	804	6	541	34	11	212	0		0		0		0	
		2004	18	794	792	31	550	30	18	163	0		0		0		0	
		2005	17	702	702	12	382	24	21	260	0		0		0		4	0.57
		2006	15	600	597	58	272	43	23	196	0		1	0.17	0		5	0.84
		2007	15	500	498	16	243	20	8	209	0		0		0		2	0.4
		2008	15	493	488	187	210	25	23	43	0		0		0		0	
	2017	2003	17	806	806	2	389	6	10	399	0		0		0		0	
		2004	17	789	789	91	515	146	1	36	0		0		0		0	
		2005	16	701	700	11	437	32	3	218	0		0		0		0	
		2006	21	599	598	0	445	13	7	134	0		0		0		0	
		2007	20	499	497	0	417	5	4	71	0		0		0		0	
		2008	20	498	496	6	319	28	5	138	0		0		0		0	
	2018	2003	19	798	798	9	604	128	17	32	2	0.25	0		4	0.5	0	
		2004	16	790	785	76	536	146	14	0	6	0.76	0		7	0.89	0	
		2005	18	703	700	118	442	109	23	4	3	0.43	0		1	0.14	0	
		2006	20	601	601	8	449	50	4	89	1	0.17	0		0		0	
		2007	19	491	490	5	329	12	9	134	1	0.2	0		0		0	
		2008	21	495	491	11	313	8	17	141	1	0.2	0		0		0	
	2019	2003	21	801	801	6	482	16	14	283	0		0		0		0	
		2004	26	795	793	25	606	29	3	130	0		0		0		0	
		2005	22	703	698	8	378	27	19	266	0		0		0		0	
		2006	23	601	601	1	386	11	4	199	0		0		0		0	
		2007	23	500	499	10	292	8	6	183	0		0		0		0	
		2008	16	496	493	307	127	15	21	23	0		0		0		0	
	2020	2003	18	805	805	3	402	4	15	381	0		0		0		0	
		2004	25	787	786	91	545	74	4	72	0		0		0		0	
		2005	19	705	705	1	420	2	1	282	0		0		0		0	
		2006	24	603	602	0	367	17	6	204	0		8	1.33	0		0	
		2007	24	501	501	0	292	3	0	206	0		0		0		0	
		2008	19	498	494	40	145	23	34	243	0		9	1.82	0		0	
	2021	2003	20	799	799	2	551	64	12	170	0		0		0		0	
		2004	24	793	792	473	256	27	36	0	0		0		0		0	
		2005	20	700	696	81	398	137	50	35	0		0		0		0	
		2006	16	598	598	1	458	30	6	103	0		0		0		0	
		2007	18	500	500	7	327	12	9	145	0		0		0		0	
		2008	23	494	494	0	327	0	0	167	0		0		0		0	
	2023	2003	22	797	797	92	400	16	1	288	0		0		0		0	
		2004	27	802	799	15	479	5	4	296	0		0		0		0	

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(3C/D, 5A)																		
	2023	2005	21	701	701	163	296	112	23	107	0		0		0		0	
		2006	22	601	600	178	240	84	20	78	0		0		0		0	
		2007	22	499	498	249	130	18	25	76	0		0		0		0	
		2008	17	498	496	398	52	8	29	8	0		0		0		0	
	2024	2003	23	802	801	28	431	19	14	296	0		14	1.75	0		0	
		2004	28	802	789	45	447	31	37	193	0		32	4.06	0		4	0.51
		2005	23	701	329	43	183	21	27	35	0		18	4.86	0		5	1.52
		2006	25	598	593	75	280	68	32	96	0		36	6.07	0		8	1.35
		2007	25	501	484	40	257	28	12	114	0		30	6.2	0		3	0.62
		2008	18	493	488	234	153	33	31	2	0		34	6.97	0		3	0.61
	2025	2003	25	800	800	3	447	17	9	324	0		0		0		0	
		2004	23	804	804	40	554	165	21	24	0		0		0		0	
		2005	26	702	701	0	462	34	15	196	0		0		0		0	
		2006	17	603	603	0	426	23	2	152	0		0		0		0	
		2007	17	498	497	0	341	5	11	140	0		0		0		0	
		2008	25	499	499	1	297	1	1	199	0		0		0		0	
	2026	2003	27	807	807	63	449	125	12	157	0		1	0.12	0		0	
		2004	22	797	794	24	455	292	21	0	2	0.25	0		0		0	
		2005	27	703	702	1	395	232	23	50	2	0.28	3	0.43	0		0	
		2006	18	601	600	2	404	36	11	147	0		0		0		0	
		2007	16	495	492	1	354	13	9	113	4	0.81	0		0		0	
		2008	24	502	493	0	263	15	14	199	2	0.41	0		0		0	
	2027	2003	24	804	804	36	340	10	2	412	0		0		0		4	0.5
		2004	30	794	789	14	434	12	5	323	0		1	0.13	0		0	
		2005	24	704	704	51	442	75	30	106	0		0		0		0	
		2006	26	597	596	125	314	67	17	74	0		0		0		0	
		2007	26	495	495	92	240	74	13	76	0		0		0		1	0.2
		2008	26	493	491	393	73	10	8	7	0		0		0		0	
	2028	2003	26	794	794	16	471	12	3	292	0		0		0		0	
		2004	29	796	794	73	529	21	17	153	0		1	0.13	0		0	
		2005	25	706	703	19	437	58	41	150	0		0		0		0	
		2006	27	602	601	7	285	64	34	211	0		0		0		0	
		2007	27	501	498	17	228	31	44	178	0		0		0		0	
		2008	27	497	486	184	159	49	43	51	0		0		0		0	
	2029	2003	28	798	798	3	442	21	16	316	0		0		0		0	
		2004	19	799	798	256	352	186	4	0	0		0		0		0	
		2005	28	702	702	3	471	41	2	192	0		0		0		0	
		2006	28	601	600	0	406	11	8	175	0		0		0		0	
		2007	28	501	498	8	308	19	26	137	0		0		0		0	
		2008	28	500	498	5	235	8	8	242	0		0		0		0	
	2030	2003	29	811	811	3	420	39	32	317	0		0		0		0	
		2004	20	793	793	58	553	153	29	0	0		0		0		0	
		2005	29	706	706	1	445	31	11	219	0		0		0		0	
		2006	29	599	599	2	424	11	7	155	0		0		0		0	
		2007	29	496	496	36	248	52	47	113	0		0		0		0	
		2008	29	496	494	127	189	34	36	108	0		0		0		0	
	2031	2003	30	791	791	13	435	101	16	214	9	1.14	0		3	0.38	0	
		2004	21	786	783	80	449	190	27	5	21	2.68	8	1.02	2	0.26	0	
		2005	30	700	699	16	363	206	55	46	16	2.29	0		1	0.14	0	
		2006	30	599	597	0	454	26	6	103	6	1.01	2	0.34	0		0	
		2007	30	497	496	6	291	31	14	141	10	2.02	2	0.4	1	0.2	0	
		2008	30	497	490	5	231	27	7	179	15	3.06	0		0		0	
	2032	2003	31	804	804	22	321	5	29	426	0		0		0		1	0.12
		2004	31	795	794	237	435	3	73	44	0		1	0.13	0		1	0.13
		2005	31	701	697	93	333	11	157	102	0		0		0		1	0.14
		2006	31	601	601	7	328	15	143	108	0		0		0		0	
		2007	31	499	498	43	308	4	100	43	0		0		0		0	
		2008	31	495	493	187	204	7	75	20	0		0		0		0	
	2033	2003	32	801	801	5	458	39	9	282	23	2.87	4	0.5	0		0	
		2004	32	799	794	33	563	175	6	1	14	1.76	0		2	0.25	0	
		2005	32	704	703	2	356	65	11	257	12	1.71	0		0		0	
		2006	32	599	599	4	408	10	2	165	0		10	1.67	0		0	
		2007	32	502	500	2	210	20	14	254	0		0		0		0	
		2008	32	495	490	1	208	14	12	251	0		4	0.82	0		0	
	2034	2003	33	788	788	16	345	21	68	335	0		1	0.13	0		2	0.25
		2004	33	798	796	121	575	19	66	10	0		3	0.38	0		2	0.25
		2005	33	705	704	47	460	15	114	51	0		11	1.56	0		6	0.85

Area (3C/D, 5A)	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
	2034	2006	33	602	602	25	368	31	94	81	0		3	0.5	0		0	
		2007	33	497	496	9	255	20	39	174	0		0		0		0	
		2008	33	498	496	86	250	26	93	34	0		4	0.81	0		3	0.6
	2035	2003	34	802	802	11	524	52	11	183	3	0.37	18	2.24	0		0	
		2004	34	792	784	146	361	59	73	2	92	11.7	51	6.51	0		0	
		2005	34	699	699	9	368	53	41	211	9	1.29	10	1.43	0		0	
		2006	34	601	600	3	415	9	9	153	2	0.33	9	1.5	0		0	
		2007	34	499	498	50	218	20	39	140	11	2.21	20	4.02	0		0	
		2008	34	488	487	1	261	13	12	194	5	1.03	1	0.21	0		0	
	2037	2003	35	800	800	4	484	88	20	186	8	1	10	1.25	0		0	
		2004	35	793	789	83	444	208	18	2	11	1.39	23	2.92	0		0	
		2005	35	702	699	6	328	141	38	131	29	4.15	29	4.15	0		0	
		2006	35	602	597	1	404	21	13	132	21	3.52	6	1.01	0		0	
		2007	35	497	497	3	276	21	24	130	30	6.04	13	2.62	0		0	
		2008	35	488	486	0	301	4	5	170	5	1.03	2	0.41	0		0	
	2038	2003	36	800	800	230	472	10	43	41	0		3	0.38	0		1	0.12
		2004	82	794	791	22	635	28	104	2	0		0		0		0	
		2005	37	704	703	49	461	64	84	14	0		30	4.27	0		2	0.28
		2006	36	596	596	41	358	35	76	71	0		12	2.01	0		4	0.67
		2007	36	501	501	76	244	58	35	69	0		12	2.4	0		7	1.4
		2008	37	495	494	216	165	37	45	8	0		17	3.44	0		6	1.21
	2039	2003	37	792	792	6	536	27	7	201	9	1.14	6	0.76	0		0	
		2004	36	796	793	35	609	109	21	5	7	0.88	7	0.88	0		0	
		2005	38	703	703	9	434	46	14	173	20	2.84	10	1.42	0		0	
		2006	37	603	602	7	425	4	2	164	0		0		0		0	
		2007	69	500	499	0	325	5	2	166	1	0.2	1	0.2	0		0	
		2008	38	498	493	10	266	6	10	201	0		0		0		0	
	2040	2003	38	793	793	51	630	40	66	3	0		1	0.13	0		2	0.25
		2004	83	795	790	67	554	73	91	5	0		0		0		0	
		2005	36	702	702	35	486	61	102	9	0		6	0.85	0		3	0.43
		2006	40	599	597	100	360	40	91	2	0		1	0.17	0		3	0.5
		2007	68	496	495	79	302	54	47	6	0		1	0.2	0		7	1.41
		2008	38	494	489	91	318	40	36	3	0		1	0.2	0		0	
	2041	2003	53	800	800	24	616	87	69	3	0		0		1	0.12	0	
		2004	50	797	794	117	554	91	29	3	0		0		0		0	
		2005	78	701	700	59	516	85	36	4	0		0		0		0	
		2006	43	600	599	0	419	4	1	175	0		0		0		0	
		2007	37	500	500	61	332	43	53	11	0		0		0		0	
		2008	66	494	488	148	237	30	51	23	0		0		0		0	
	2042	2003	52	788	788	215	506	27	30	1	0		7	0.89	0		2	0.25
		2004	49	793	784	163	500	55	42	9	0		14	1.79	0		1	0.13
		2005	79	698	696	40	530	30	90	1	0		5	0.72	0		0	
		2006	42	603	603	36	458	57	27	21	0		4	0.66	0		0	
		2007	38	499	499	72	368	18	38	4	0		1	0.2	0		0	
		2008	65	499	495	82	340	15	40	11	0		3	0.61	0		4	0.81
	2043	2003	54	798	798	16	539	36	27	180	0		0		0		0	
		2004	51	801	799	85	558	61	31	64	0		0		0		0	
		2005	81	702	701	29	483	87	29	73	0		0		0		0	
		2006	45	601	600	6	390	52	17	140	0		0		0		0	
		2007	40	501	500	36	292	43	100	35	0		0		0		0	
		2008	63	496	490	33	276	34	65	82	1	0.2	0		0		0	
	2044	2003	41	797	797	164	481	24	57	16	0		45	5.65	0		10	1.25
		2004	80	792	789	81	514	47	70	0	0		72	9.13	0		5	0.63
		2005	40	705	699	72	492	24	81	1	0		29	4.15	0		0	
		2006	38	598	594	105	354	35	89	4	0		8	1.35	0		0	
		2007	70	501	498	33	346	14	80	11	0		13	2.61	0		1	0.2
		2008	43	495	491	310	122	17	37	2	0		2	0.41	0		1	0.2
	2045	2003	42	610	610	276	243	8	72	7	0		4	0.66	0		0	
		2004	79	787	780	155	451	43	89	13	0		29	3.72	0		0	
		2005	39	703	700	118	389	15	143	3	0		34	4.86	0		0	
		2006	39	596	596	75	348	18	93	18	0		44	7.38	0		0	
		2007	82	494	492	19	252	24	83	79	0		35	7.11	0		0	
		2008	44	499	488	315	135	4	9	17	0		8	1.64	0		0	
	2046	2003	51	801	801	155	578	34	30	0	0		2	0.25	0		2	0.25
		2004	84	791	789	43	670	14	62	0	0		0		0		0	
		2005	76	702	700	31	550	7	99	1	0		10	1.43	0		2	0.29
		2006	41	594	592	81	455	5	48	0	0		3	0.51	0		0	

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(3C/D, 5A)																		
	2046	2007	67	501	500	74	355	3	61	7	0		0		0		0	
		2008	41	494	490	51	370	5	57	3	0		4	0.82	0		0	
	2047	2003	39	794	794	213	487	2	73	3	0		4	0.5	0		12	1.51
		2004	72	794	793	461	274	15	40	1	0		1	0.13	0		1	0.13
		2005	75	702	702	118	512	5	62	3	0		0		0		2	0.28
		2006	64	597	597	112	436	5	36	7	0		0		0		1	0.17
		2007	64	496	495	325	125	1	43	1	0		0		0		0	
		2008	39	496	494	333	125	1	34	0	0		1	0.2	0		0	
	2048	2003	40	792	792	100	622	5	61	4	0		0		0		0	
		2004	81	789	787	93	627	7	60	0	0		0		0		0	
		2005	41	700	700	32	608	5	51	4	0		0		0		0	
		2006	61	600	600	115	455	8	19	3	0		0		0		0	
		2007	71	497	496	393	81	3	14	5	0		0		0		0	
		2008	42	491	488	324	135	11	18	2	0		0		0		0	
	2049	2003	43	801	801	213	508	24	51	7	0		0		0		0	
		2004	77	788	785	72	565	106	38	6	0		0		0		0	
		2005	42	703	702	24	544	99	27	8	0		1	0.14	0		0	
		2006	59	600	600	100	379	57	42	23	0		0		0		0	
		2007	72	500	499	212	220	27	12	27	0		1	0.2	0		0	
		2008	45	499	497	348	73	7	28	41	0		0		0		0	
	2050	2003	44	792	792	111	375	62	35	198	10	1.26	1	0.13	0		0	
		2004	76	790	781	221	324	91	54	12	64	8.19	15	1.92	0		0	
		2005	43	703	699	48	341	86	68	89	48	6.87	21	3	0		0	
		2006	60	594	593	10	331	45	10	122	50	8.43	26	4.38	0		0	
		2007	83	496	494	2	296	19	8	145	16	3.24	12	2.43	0		0	
		2008	53	500	489	55	156	81	41	105	48	9.82	5	1.02	0		0	
	2051	2003	55	796	796	11	519	8	34	214	0		9	1.13	1	0.13	0	
		2004	54	793	787	172	471	36	62	41	0		5	0.64	0		0	
		2005	80	704	702	23	455	60	66	70	0		29	4.13	0		0	
		2006	46	598	597	14	345	11	10	204	0		13	2.18	0		0	
		2007	39	491	483	219	202	4	26	13	0		18	3.73	0		1	0.21
		2008	64	498	498	220	196	7	31	36	0		9	1.81	0		0	
	2052	2003	56	800	800	395	296	55	40	13	1	0.12	0		0		0	
		2004	53	795	793	209	515	32	20	14	3	0.38	0		0		0	
		2005	77	701	699	195	446	23	23	2	10	1.43	0		0		0	
		2006	47	598	598	5	452	8	2	130	1	0.17	0		0		0	
		2007	66	501	501	184	241	16	9	45	6	1.2	0		0		0	
		2008	40	492	483	22	280	72	43	65	1	0.21	0		0		0	
	2053	2003	57	798	798	557	187	0	54	0	0		0		0		0	
		2004	71	795	792	254	411	18	109	0	0		0		0		0	
		2005	74	701	699	66	521	9	103	0	0		0		0		0	
		2006	63	600	599	19	473	10	96	1	0		0		0		0	
		2007	65	498	498	167	266	6	57	2	0		0		0		0	
		2008	47	493	490	191	208	5	79	7	0		0		0		0	
	2054	2003	63	801	801	138	570	8	81	4	0		0		0		0	
		2004	70	794	793	336	325	78	52	2	0		0		0		0	
		2005	73	704	704	101	500	17	79	7	0		0		0		0	
		2006	62	599	599	42	454	29	70	4	0		0		0		0	
		2007	74	498	498	33	327	15	117	6	0		0		0		0	
		2008	46	504	501	149	250	10	80	13	0		1	0.2	0		0	
	2055	2003	45	800	800	148	401	140	64	19	21	2.62	0		7	0.88	0	
		2004	78	795	789	188	457	85	36	4	12	1.52	0		7	0.89	0	
		2005	45	703	702	12	402	216	43	11	14	1.99	0		5	0.71	0	
		2006	58	597	595	16	397	146	22	12	2	0.34	0		0		0	
		2007	73	500	498	15	348	70	17	43	4	0.8	0		1	0.2	0	
		2008	51	493	493	34	291	93	54	13	5	1.01	0		3	0.61	0	
	2056	2003	46	798	798	78	538	125	18	39	0		0		0		0	
		2004	75	795	780	319	336	59	49	10	6	0.77	0		1	0.13	0	
		2005	44	702	701	6	420	134	54	86	3	0.43	0		0		0	
		2006	57	601	600	49	391	107	8	43	2	0.33	0		0		0	
		2007	84	502	500	1	338	31	6	124	0		0		0		0	
		2008	52	500	491	61	221	88	89	31	1	0.2	0		0		0	
	2058	2003	78	803	803	82	641	23	39	18	0		0		0		0	
		2007	42	498	497	152	291	11	26	17	0		0		0		0	
5B																		
	2057	2003	74	803	803	152	488	32	73	53	0		3	0.37	0		2	0.25

Area (5B)	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
	2057	2004	39	800	795	104	551	45	29	50	0		16	2.01	0		0	
		2005	84	695	695	71	536	23	7	56	0		2	0.29	0		0	
		2006	44	603	602	32	400	16	13	132	0		5	0.83	0		4	0.66
		2007	41	501	500	58	358	15	25	41	0		5	1	0		0	
		2008	62	498	495	18	378	10	25	59	0		5	1.01	0		0	
	2058	2004	37	798	796	122	584	37	44	9	0		0		0		0	
		2005	83	701	700	48	594	13	36	10	0		0		0		0	
		2006	48	601	601	80	479	15	23	4	0		0		0		0	
		2008	61	501	499	252	174	16	41	16	0		0		0		0	
	2059	2003	77	801	801	485	269	18	12	13	1	0.12	3	0.37	0		0	
		2004	52	799	796	115	533	78	17	25	28	3.52	0		0		0	
		2005	70	701	700	99	471	69	11	47	5	0.71	0		0		0	
		2006	83	597	597	203	318	48	18	8	2	0.34	0		0		0	
		2007	43	498	497	89	320	43	19	26	0		0		0		0	
		2008	59	499	497	48	383	5	32	51	0		0		0		0	
	2060	2003	58	794	794	60	493	114	55	70	1	0.13	1	0.13	0		0	
		2004	55	798	790	136	486	95	35	10	28	3.54	0		0		0	
		2005	71	700	698	61	475	95	27	13	28	4.01	0		0		0	
		2006	84	597	595	111	386	69	12	6	11	1.85	0		0		0	
		2007	62	500	498	2	391	31	24	47	3	0.6	0		0		0	
		2008	49	488	491	33	271	56	49	70	1	0.21	1	0.21	0		0	
	2061	2003	62	801	801	66	587	90	27	2	18	2.25	0		1	0.12	0	
		2004	68	793	791	269	411	42	25	3	29	3.67	0		12	1.52	0	
		2005	72	703	702	78	448	115	26	1	33	4.7	0		1	0.14	0	
		2006	52	605	604	63	432	71	12	10	16	2.65	0		0		0	
		2007	63	504	497	5	354	104	22	3	11	2.21	0		1	0.2	0	
		2008	49	498	495	5	307	131	30	17	9	1.82	0		0		0	
	2062	2003	64	803	803	101	653	28	16	2	2	0.25	0		1	0.12	0	
		2004	69	794	789	144	495	42	56	2	29	3.68	0		21	2.66	0	
		2005	54	701	701	19	530	77	60	4	11	1.57	0		0		0	
		2006	56	602	599	37	451	46	39	15	9	1.5	0		2	0.33	0	
		2007	76	501	499	1	349	80	27	39	3	0.6	0		1	0.2	0	
		2008	50	499	497	22	254	92	89	30	9	1.81	0		1	0.2	0	
	2063	2003	47	798	798	101	510	44	69	54	14	1.75	6	0.75	0		0	
		2004	74	794	790	224	386	75	84	9	11	1.39	1	0.13	0		0	
		2005	53	704	704	18	521	67	33	60	3	0.43	2	0.28	0		0	
		2006	55	598	597	72	392	51	28	51	1	0.17	2	0.34	0		0	
		2007	77	499	497	2	349	44	16	85	1	0.2	0		0		0	
		2008	67	499	493	55	227	68	7	130	5	1.01	1	0.2	0		0	
	2064	2003	48	795	795	57	571	80	23	57	7	0.88	0		0		0	
		2004	73	797	794	172	435	125	48	1	12	1.51	1	0.13	0		0	
		2005	46	703	702	20	466	130	13	66	8	1.14	0		0		0	
		2006	65	600	600	24	399	101	7	61	8	1.33	0		0		0	
		2007	81	501	500	4	331	69	4	85	7	1.4	0		0		0	
		2008	70	500	496	5	307	80	10	93	1	0.2	0		0		0	
	2065	2003	75	799	799	228	486	6	65	21	0		10	1.25	0		3	0.38
		2004	38	798	795	145	488	21	56	32	0		48	6.04	0		5	0.63
		2005	82	701	701	90	417	27	22	67	0		60	8.56	0		18	2.57
		2006	49	595	590	74	329	20	45	57	0		57	9.66	0		9	1.53
		2007	44	493	489	24	380	11	25	20	0		27	5.52	0		4	0.82
		2008	60	496	492	170	185	15	31	25	0		50	10.1	0		7	1.42
	2066	2003	78	806	806	398	373	27	1	14	3	0.37	0		0		0	
		2004	57	803	799	97	550	73	0	51	25	3.13	0		3	0.38	0	
		2005	69	704	701	69	531	77	3	5	15	2.14	0		1	0.14	0	
		2006	82	599	599	108	397	64	8	3	17	2.84	0		4	0.67	0	
		2007	45	498	498	35	372	33	18	34	3	0.6	0		1	0.2	0	
		2008	58	500	494	169	223	58	23	17	3	0.61	0		1	0.2	0	
	2067	2003	59	801	801	122	508	8	11	152	0		0		0		0	
		2004	56	795	793	70	576	15	20	112	0		0		0		0	
		2005	68	702	702	62	445	27	23	145	0		0		0		0	
		2006	50	602	602	34	406	13	7	143	0		0		0		0	
		2007	61	497	497	8	384	10	7	108	0		0		0		0	
		2008	57	492	491	24	332	6	13	116	0		0		0		0	
	2068	2003	61	794	794	283	374	8	13	114	0		2	0.25	0		0	
		2004	67	796	796	132	371	30	28	234	0		1	0.13	0		0	
		2005	67	705	705	99	315	36	36	216	0		3	0.43	0		0	
		2006	51	599	599	113	310	19	16	140	0		0		0		0	

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5B)																		
	2068	2007	60	493	493	137	219	30	26	82	0		0		0		0	
		2008	72	499	498	235	141	8	38	76	0		0		0		0	
	2069	2003	65	802	802	1	453	1	3	343	0		1	0.12	0		0	
		2004	66	798	791	5	486	1	16	282	0		1	0.13	0		0	
		2005	66	701	699	23	355	15	29	269	0		11	1.57	0		0	
		2006	53	599	588	41	387	10	39	127	0		4	0.68	0		0	
		2007	75	498	497	9	312	10	28	132	0		6	1.21	0		0	
		2008	71	497	492	18	242	8	137	82	0		7	1.42	0		0	
	2070	2003	66	799	799	30	472	24	191	11	0		69	8.64	0		2	0.25
		2004	65	792	783	47	479	17	129	0	0		111	14.1	0		0	
		2005	52	700	700	42	418	20	128	22	0		70	10	0		0	
		2006	54	600	587	51	404	9	58	50	0		17	2.9	0		0	
		2007	78	497	496	2	320	3	21	111	0		39	7.86	0		1	0.2
		2008	68	493	490	5	230	5	102	77	0		73	14.9	0		0	
	2071	2003	49	791	791	69	386	67	65	138	8	1.01	58	7.33	0		0	
		2004	62	797	790	142	327	70	109	1	7	0.89	134	16.9	0		0	
		2005	48	701	699	17	365	69	43	116	6	0.86	83	11.8	0		0	
		2006	67	599	596	3	345	40	58	76	7	1.17	67	11.2	0		0	
		2007	79	497	494	3	291	36	26	77	3	0.61	58	11.7	0		0	
		2008	69	496	493	153	130	62	38	28	5	1.01	77	15.6	0		0	
	2072	2003	50	793	793	94	488	129	19	23	20	2.52	1	0.13	19	2.4	0	
		2004	63	796	786	148	408	157	30	1	29	3.69	0		13	1.65	0	
		2005	47	703	696	103	411	71	30	48	28	4.02	0		5	0.72	0	
		2006	66	600	600	41	341	76	22	106	15	2.5	0		0		0	
		2007	80	501	501	6	328	78	11	68	9	1.8	0		0		0	
		2008	56	494	482	22	329	79	9	17	26	5.39	0		0		0	
	2073	2003	80	804	804	497	283	12	8	4	0		0		0		0	
		2004	40	799	798	437	277	28	19	32	4	0.5	1	0.13	0		0	
		2005	55	701	696	151	418	73	16	23	11	1.58	4	0.57	0		0	
		2006	81	596	595	42	401	84	49	19	0		0		0		0	
		2007	46	503	501	5	416	22	31	23	2	0.4	2	0.4	0		0	
		2008	79	500	492	196	146	38	102	8	2	0.41	0		0		0	
	2074	2003	60	800	800	18	515	0	24	243	0		0		0		0	
		2004	59	791	791	32	415	7	20	317	0		0		0		0	
		2005	64	703	702	0	425	0	2	275	0		0		0		0	
		2006	78	598	598	6	406	2	14	171	0		0		0		0	
		2007	58	501	500	38	310	9	33	110	0		0		0		0	
		2008	73	498	496	108	207	2	20	159	0		0		0		0	
	2075	2003	67	798	798	4	572	8	26	188	0		0		0		0	
		2004	60	800	800	86	482	97	41	94	0		0		0		0	
		2005	65	701	700	0	422	0	2	276	0		0		0		0	
		2006	77	597	597	56	375	9	37	120	0		0		0		0	
		2007	59	502	501	188	214	17	31	51	0		0		0		0	
		2008	74	492	490	4	277	4	43	162	0		0		0		0	
	2076	2003	68	799	799	486	221	4	61	26	0		1	0.13	0		0	
		2004	64	789	786	175	408	51	102	50	0		0		0		0	
		2005	49	702	701	123	437	5	51	84	0		1	0.14	0		0	
		2006	68	600	598	1	428	3	8	158	0		0		0		0	
		2007	53	502	502	1	336	0	41	124	0		0		0		0	
		2008	54	499	499	3	277	1	9	209	0		0		0		0	
	2077	2003	69	795	795	103	527	80	31	35	14	1.76	5	0.63	0		0	
		2004	61	796	773	132	457	124	31	0	9	1.16	11	1.42	9	1.16	0	
		2005	51	701	700	23	493	94	11	70	7	1	0		2	0.29	0	
		2006	69	596	595	9	454	85	2	36	5	0.84	0		5	0.84	0	
		2007	52	496	492	138	275	55	8	8	6	1.22	0		2	0.41	0	
		2008	55	499	494	30	302	87	34	6	21	4.25	3	0.61	11	2.23	0	
	2078	2003	79	801	801	68	668	26	35	4	0		0		0		0	
		2004	42	798	792	134	605	33	11	4	2	0.25	2	0.25	1	0.13	0	
		2005	56	702	701	23	529	62	40	10	5	0.71	15	2.14	0		18	2.57
		2006	79	602	600	40	469	46	25	1	17	2.83	0		0		3	0.5
		2007	47	497	497	13	414	24	20	6	11	2.21	4	0.8	0		5	1.01
		2008	78	495	485	87	253	38	79	8	15	3.09	5	1.03	0		0	
	2079	2003	81	802	802	33	600	18	120	31	0		0		0		0	
		2004	41	797	795	127	563	12	88	5	0		0		0		0	
		2005	57	702	702	31	419	83	146	24	0		0		0		0	
		2006	80	600	599	47	383	26	133	12	0		0		0		0	
		2007	56	494	493	1	349	13	98	32	0		0		0		0	

Area (5B)	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
	2079	2008	80	500	494	80	241	22	144	10	0		0		0		0	
	2080	2003	73	795	795	95	460	2	30	163	0		42	5.28	0		3	0.38
		2004	58	795	788	293	347	12	66	43	0		26	3.3	0		1	0.13
		2005	61	701	699	162	326	4	48	147	0		10	1.43	0		2	0.29
		2006	75	598	598	21	407	15	110	32	0		12	2.01	0		1	0.17
		2007	57	495	491	49	303	14	30	86	0		9	1.83	0		2	0.41
		2008	81	495	492	22	274	4	119	59	0		11	2.24	0		3	0.61
	2081	2003	71	800	800	424	247	4	36	89	0		0		0		0	
		2004	47	800	798	12	534	19	52	181	0		0		0		0	
		2005	63	700	700	63	459	9	48	121	0		0		0		0	
		2006	76	603	603	62	426	30	39	46	0		0		0		0	
		2007	55	499	499	4	353	8	54	80	0		0		0		0	
		2008	77	499	496	4	313	3	36	140	0		0		0		0	
	2082	2003	70	800	800	4	711	48	22	1	12	1.5	0		2	0.25	0	
		2004	48	793	787	66	585	45	25	4	34	4.32	0		28	3.56	0	
		2005	50	703	697	68	514	54	11	26	20	2.87	0		4	0.57	0	
		2006	70	603	603	21	493	55	9	10	15	2.49	0		1	0.17	0	
		2007	54	499	499	43	345	48	17	33	13	2.61	0		0		0	
		2008	75	493	490	105	235	83	16	12	20	4.08	0		19	3.88	0	
	2083	2003	82	800	800	70	509	98	50	57	16	2	0		0		0	
		2004	44	795	787	130	523	92	10	11	20	2.54	1	0.13	0		0	
		2005	58	702	701	99	425	129	8	17	23	3.28	0		0		0	
		2006	72	597	597	44	405	58	21	26	43	7.2	0		0		0	
		2007	49	499	497	45	380	14	23	25	10	2.01	0		0		0	
		2008	83	499	498	93	214	19	45	12	115	23.0	0		0		0	
	2084	2003	84	805	805	228	443	13	77	41	0		3	0.37	0		0	
		2004	43	798	789	216	411	72	73	4	0		13	1.65	0		0	
		2005	60	702	702	20	465	62	77	74	0		4	0.57	0		0	
		2006	73	595	592	50	403	24	105	8	0		2	0.34	0		0	
		2007	50	501	500	31	323	47	72	21	0		6	1.2	0		0	
		2008	82	498	493	146	180	38	77	43	0		9	1.83	0		0	
	2085	2003	72	801	801	284	487	5	5	19	1	0.12	0		0		0	
		2004	46	798	797	350	344	22	26	33	22	2.76	0		0		0	
		2005	62	703	702	23	628	13	7	25	7	1	0		0		0	
		2006	74	604	603	17	494	25	14	53	0		0		0		0	
		2007	51	502	502	55	392	6	16	33	0		0		0		0	
		2008	76	502	490	155	267	7	11	38	12	2.45	0		0		0	
	2086	2003	83	803	803	489	262	18	20	5	9	1.12	0		0		0	
		2004	45	800	791	197	483	22	15	2	68	8.6	4	0.51	0		0	
		2008	84	500	496	107	220	58	41	17	49	9.88	3	0.6	1	0.2	0	
	2087	2003	3	795	795	6	639	114	7	4	12	1.51	0		13	1.64	0	
		2004	41	792	790	4	523	137	10	0	27	3.42	1	0.13	88	11.1	0	
		2005	33	699	690	27	448	156	8	16	11	1.59	0		25	3.62	0	
		2006	12	595	571	10	394	128	19	20	2	0.35	0		1	0.18	0	
		2007	17	482	473	1	354	93	5	19	0		0		3	0.63	0	
		2008	3	488	488	34	302	103	4	2	19	3.89	0		24	4.92	0	
	2088	2003	4	784	784	267	366	99	7	6	39	4.97	0		0		0	
		2004	42	797	794	77	497	82	108	2	27	3.4	0		1	0.13	0	
		2005	31	696	693	173	291	96	15	42	76	10.9	0		0		0	
		2006	13	598	583	40	309	39	17	113	65	11.1	1	0.17	0		0	
		2007	16	485	483	1	355	39	10	70	9	1.86	0		0		0	
		2008	4	490	487	131	223	52	44	21	15	3.08	0		1	0.21	0	
	2089	2003	1	793	793	47	660	45	29	4	4	0.5	0		4	0.5	0	
		2004	10	803	800	121	548	64	16	36	14	1.75	0		1	0.12	0	
		2005	35	692	688	165	385	42	16	53	24	3.49	2	0.29	1	0.15	0	
		2006	10	585	580	21	314	6	53	185	0		1	0.17	0		0	
		2007	10	493	489	2	368	24	24	57	14	2.86	0		0		0	
		2008	15	503	501	221	220	33	6	1	19	3.79	0		1	0.2	0	
	2090	2003	2	786	786	108	399	70	109	41	7	0.89	52	6.62	0		0	
		2004	40	804	800	97	426	83	98	2	27	3.38	67	8.38	0		0	
		2005	34	701	694	135	296	82	41	101	3	0.43	36	5.19	0		0	
		2006	11	566	550	22	258	30	55	119	13	2.36	53	9.64	0		0	
		2007	18	492	485	0	320	23	43	90	1	0.21	8	1.65	0		0	
		2008	2	494	491	148	182	41	69	23	7	1.43	21	4.28	0		0	
	2091	2003	5	788	788	253	276	40	160	18	9	1.14	32	4.06	0		0	
		2004	39	805	798	39	503	56	109	5	47	5.89	39	4.89	0		0	
		2005	32	694	688	101	255	48	128	76	34	4.94	46	6.69	0		0	

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5B)																		
	2091	2006	14	590	582	11	270	34	67	166	16	2.75	20	3.44	0		0	
		2007	15	488	478	0	292	7	13	137	7	1.46	22	4.6	0		0	
		2008	1	477	476	161	170	33	29	21	19	3.99	24	5.04	0		0	
	2092	2003	6	788	788	72	533	48	104	16	2	0.25	0		13	1.65	0	
		2004	35	799	141	10	74	30	18	0	0		0		9	6.38	0	
		2005	30	699	693	198	267	87	102	38	1	0.14	0		0		0	
		2006	15	589	433	16	209	18	92	98	2	0.48	0		0		0	
		2007	12	481	479	0	285	69	66	54	1	0.21	0		4	0.84	0	
		2008	6	496	489	80	284	63	50	5	1	0.2	0		6	1.23	0	
	2093	2003	7	789	789	30	405	36	68	21	47	5.96	182	23.0	0		0	
		2004	34	795	791	20	541	18	125	0	16	2.02	71	8.98	0		0	
		2005	29	657	649	68	317	28	59	66	26	4.01	87	13.4	0		0	
		2006	16	600	584	10	284	21	48	146	10	1.71	86	14.7	0		0	
		2007	11	495	484	0	220	9	4	194	6	1.24	53	10.9	0		0	
		2008	7	490	479	14	243	33	81	3	17	3.55	89	18.5	0		0	
	2094	2003	78	795	795	228	430	53	46	3	21	2.64	14	1.76	0		0	
		2004	12	800	796	88	415	114	38	29	87	10.9	25	3.14	0		0	
		2005	37	700	698	149	307	86	12	130	25	3.58	9	1.29	0		0	
		2006	9	593	585	53	266	121	37	51	51	8.72	6	1.03	0		0	
		2007	9	489	480	36	244	74	21	70	28	5.83	7	1.46	0		0	
		2008	16	495	493	203	178	54	14	19	18	3.65	8	1.62	0		0	
	2095	2003	77	793	793	38	576	9	127	2	0		41	5.17	0		0	
		2004	11	800	798	63	458	16	213	10	0		38	4.76	0		0	
		2005	23	702	697	44	425	9	69	122	0		28	4.02	0		0	
		2006	8	583	574	56	225	32	85	111	0		66	11.5	0		0	
		2007	8	492	485	25	279	14	68	80	0		19	3.92	0		0	
		2008	14	494	494	28	315	7	116	14	0		14	2.83	0		0	
	2096	2003	78	794	794	46	574	16	155	3	0		0		0		0	
		2004	37	805	803	141	492	23	144	3	0		0		0		0	
		2005	36	700	697	52	456	5	85	96	0		3	0.43	0		0	
		2006	20	618	613	27	313	12	73	188	0		0		0		0	
		2007	7	490	488	6	285	5	42	150	0		0		0		0	
		2008	11	500	494	33	289	9	151	12	0		0		0		0	
	2097	2003	11	791	791	3	666	116	0	3	0		0		3	0.38	0	
		2004	38	802	798	15	634	135	10	1	2	0.25	0		1	0.13	0	
		2005	28	696	694	45	492	132	7	17	0		0		2	0.29	0	
		2006	19	586	582	29	367	153	10	17	1	0.17	0		5	0.86	0	
		2007	6	489	487	0	392	43	5	47	0		0		0		0	
		2008	12	497	497	30	357	104	2	0	1	0.2	0		3	0.6	0	
	2098	2003	9	785	785	307	348	40	76	9	5	0.64	0		0		0	
		2004	36	804	803	100	516	96	79	1	11	1.37	0		0		0	
		2005	24	699	695	233	260	71	30	99	2	0.29	0		0		0	
		2006	18	596	589	11	305	22	20	231	3	0.51	0		0		0	
		2007	13	495	494	0	239	14	35	204	2	0.4	0		0		0	
		2008	5	499	498	273	140	58	22	3	2	0.4	0		0		0	
	2099	2003	8	792	792	235	462	17	61	8	1	0.13	8	1.01	0		0	
		2004	33	799	794	179	460	16	123	4	0		12	1.51	0		0	
		2005	25	699	697	138	318	15	41	182	2	0.29	1	0.14	0		0	
		2006	17	584	582	5	359	5	11	201	0		1	0.17	0		0	
		2007	14	493	486	0	266	4	8	151	0		2	0.41	0		0	
		2008	8	495	489	41	343	7	33	62	1	0.2	3	0.61	0		0	
	2100	2007	71	479	479	111	231	12	20	20	33	6.89	52	10.8	0		0	
	2101	2004	14	797	795	30	658	20	3	79	7	0.88	0		0		0	
		2006	3	588	577	34	447	24	13	57	2	0.35	0		0		0	
		2007	70	492	490	193	270	6	4	14	3	0.61	0		0		0	
	2102	2003	79	796	796	232	498	38	22	3	2	0.25	1	0.13	0		0	
		2004	8	800	799	56	555	101	7	17	63	7.88	0		0		0	
		2006	4	589	579	27	326	105	19	55	48	8.29	0		0		0	
	2103	2004	9	799	796	290	372	20	21	49	44	5.53	0		0		0	
	2104	2006	21	586	586	5	298	28	43	213	0		0		0		0	
		2007	4	493	491	0	321	3	8	159	0		0		0		0	
	2105	2004	2	804	801	3	586	208	1	0	1	0.12	0		4	0.5	0	
		2006	33	594	583	7	398	156	4	9	3	0.51	0		7	1.2	0	
	2106	2004	32	800	798	160	424	30	165	2	7	0.88	10	1.25	0		0	
		2005	11	698	686	74	318	10	43	191	41	5.98	9	1.31	0		0	
		2006	34	591	583	180	235	20	19	89	40	6.86	0		0		0	

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5B)																		
	2106	2007	80	499	495	61	256	9	20	142	7	1.41	0		0		0	
	2107	2003	16	793	791	324	390	35	33	2	7	0.88	0		0		0	
		2006	35	594	589	40	329	52	90	78	1	0.17	0		0		0	
		2007	81	495	489	15	286	6	87	94	1	0.2	0		0		0	
5C/D																		
	2086	2005	59	702	700	64	535	37	11	7	45	6.43	0		1	0.14	0	
		2006	71	597	596	55	368	57	11	17	86	14.4	1	0.17	1	0.17	0	
		2007	48	487	475	72	303	37	10	26	23	4.84	5	1.05	0		0	
	2100	2003	86	784	784	86	480	21	105	23	16	2.04	53	6.76	0		0	
		2004	13	796	793	83	526	22	44	68	7	0.88	43	5.42	0		0	
		2005	19	698	692	253	237	39	52	21	40	5.78	51	7.37	0		0	
		2006	2	579	574	106	264	38	27	60	36	6.27	43	7.49	0		0	
		2008	47	494	491	110	216	19	21	46	35	7.13	44	8.96	0		0	
	2101	2003	85	789	789	305	466	11	5	2	0		0		0		0	
		2005	18	700	695	246	358	41	12	24	13	1.87	1	0.14	0		0	
		2008	48	489	485	167	247	18	6	41	6	1.24	0		0		0	
	2102	2005	21	695	593	114	303	29	4	79	62	10.4	2	0.34	0		0	
		2007	73	492	488	177	224	67	3	11	7	1.43	0		0		0	
		2008	49	500	496	241	166	41	7	39	2	0.4	0		0		0	
	2103	2003	80	792	792	361	353	11	63	2	2	0.25	0		0		0	
		2005	22	702	698	59	361	8	6	260	4	0.57	0		0		0	
		2006	7	592	583	30	378	14	14	97	52	8.92	0		0		0	
		2007	74	488	483	109	318	14	11	28	3	0.62	0		0		0	
		2008	13	491	491	205	211	10	11	25	29	5.91	0		0		0	
	2104	2003	75	791	791	367	339	9	70	6	0		0		0		0	
		2004	1	798	795	233	357	43	104	58	0		0		0		0	
		2005	27	696	694	5	381	17	25	267	0		1	0.14	0		0	
		2008	10	499	497	312	88	9	45	43	0		0		0		0	
	2105	2003	10	793	793	7	587	195	1	0	3	0.38	0		0		0	
		2005	26	698	694	61	489	128	1	10	0		0		5	0.72	0	
		2007	5	493	486	10	384	72	1	18	0		0		1	0.21	0	
		2008	9	492	491	37	343	111	0	0	0		0		0		0	
	2106	2003	12	792	792	348	327	39	56	11	13	1.64	7	0.88	0		0	
		2008	18	497	490	175	209	11	65	16	3	0.61	1	0.2	0		0	
	2107	2004	31	798	796	113	545	37	92	4	5	0.63	0		0		0	
		2005	10	699	687	52	376	33	75	153	2	0.29	0		0		0	
		2008	19	500	499	30	249	17	174	24	5	1	0		0		0	
	2108	2003	84	801	801	341	326	57	38	8	29	3.62	2	0.25	0		0	
		2004	15	805	803	62	445	44	59	67	98	12.2	28	3.49	0		0	
		2005	20	700	697	55	358	58	105	33	85	12.2	4	0.57	0		0	
		2006	1	591	577	41	271	45	63	103	55	9.53	0		0		0	
		2007	69	489	478	20	225	46	169	17	2	0.42	0		0		0	
		2008	50	495	491	25	303	21	73	64	6	1.22	0		0		0	
	2109	2003	82	785	785	214	479	19	23	16	33	4.2	1	0.13	0		0	
		2004	7	798	797	33	589	48	33	67	27	3.39	0		0		0	
		2005	13	697	690	18	439	31	10	179	15	2.17	0		0		0	
		2006	5	577	566	13	400	23	30	51	50	8.83	0		0		0	
		2007	72	493	488	77	271	33	49	43	15	3.07	0		0		0	
		2008	54	495	490	40	322	11	32	70	15	3.06	0		0		0	
	2110	2003	81	785	785	19	486	7	46	2	225	28.6	0		0		0	
		2004	6	792	792	253	343	31	76	22	67	8.46	0		0		0	
		2005	12	697	692	50	408	23	60	63	89	12.8	0		0		0	
		2006	6	598	589	7	364	32	45	134	9	1.53	0		0		0	
		2007	75	497	476	5	336	15	15	22	84	17.6	0		0		0	
		2008	53	490	487	9	370	12	32	14	50	10.2	0		0		0	
	2111	2003	74	794	794	252	423	30	45	11	33	4.16	0		0		0	
		2004	5	794	793	110	434	39	36	127	47	5.93	0		0		0	
		2005	16	700	695	32	296	33	18	309	7	1.01	0		0		0	
		2006	32	586	581	22	340	7	13	190	9	1.55	0		0		0	
		2007	76	490	489	130	213	23	25	78	20	4.09	0		0		0	
		2008	58	497	495	294	125	13	37	20	6	1.21	0		0		0	
	2112	2003	73	790	790	42	620	101	15	0	9	1.14	0		3	0.38	0	
		2004	3	801	797	0	594	161	17	1	8	1	0		16	2.01	0	
		2005	8	700	696	7	447	119	48	43	5	0.72	0		29	4.17	0	
		2006	31	590	587	23	396	146	6	7	0		0		10	1.7	0	
		2007	79	491	484	5	363	90	12	10	3	0.62	0		1	0.21	0	

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5C/D)																		
	2112	2008	61	490	488	10	396	73	2	0	6	1.23	0		1	0.2	0	
	2113	2003	18	775	774	362	312	21	64	9	0		6	0.78	0		0	
		2004	30	798	798	81	542	23	104	6	7	0.88	35	4.39	0		0	
		2005	9	698	688	13	362	4	51	257	0		1	0.15	0		0	
		2006	37	590	589	320	173	4	14	67	7	1.19	4	0.68	0		0	
		2007	83	496	496	9	265	10	25	184	0		3	0.6	0		0	
	2114	2003	17	787	787	367	323	16	72	9	0		0		0		0	
		2004	29	799	798	119	549	27	99	4	0		0		0		0	
		2005	38	696	694	321	223	15	71	64	0		0		0		0	
		2006	36	596	596	49	343	5	29	170	0		0		0		0	
		2007	82	498	494	10	310	3	55	117	0		0		0		0	
		2008	20	492	482	216	193	4	45	24	0		0		0		0	
	2115	2003	83	786	786	262	436	20	31	14	0		7	0.89	0		16	2.04
		2004	16	804	803	44	586	6	29	106	0		17	2.12	0		15	1.87
		2005	14	700	690	151	366	6	17	144	0		0		0		6	0.87
		2006	25	588	583	184	174	11	76	120	0		9	1.54	0		9	1.54
		2007	3	490	479	130	224	10	76	37	0		0		0		1	0.21
		2008	51	499	491	42	302	3	30	113	0		0		0		1	0.2
	2116	2003	32	795	795	44	501	27	100	79	17	2.14	27	3.4	0		0	
		2004	17	798	797	153	389	104	68	47	16	2.01	20	2.51	0		0	
		2005	17	696	693	36	378	34	48	157	22	3.17	22	3.17	0		0	
		2006	26	595	590	3	338	22	74	139	6	1.02	8	1.36	0		0	
		2007	2	491	486	0	291	11	18	159	4	0.82	4	0.82	0		0	
		2008	52	495	494	17	263	3	74	113	9	1.82	16	3.24	0		0	
	2117	2003	33	792	792	270	451	23	24	14	10	1.26	0		0		0	
		2004	4	802	799	239	403	46	34	13	64	8.01	0		0		0	
		2005	15	703	696	187	299	41	13	130	25	3.59	0		1	0.14	0	
		2006	27	588	579	25	315	67	14	119	41	7.08	0		0		0	
		2007	77	491	484	15	341	32	43	35	19	3.93	0		0		0	
		2008	57	499	497	183	211	27	40	5	30	6.04	0		1	0.2	0	
	2118	2003	72	800	800	262	456	54	18	4	6	0.75	0		0		0	
		2004	25	799	796	90	576	62	30	13	23	2.89	0		2	0.25	0	
		2005	7	697	690	24	414	44	16	169	18	2.61	0		6	0.87	0	
		2006	30	593	589	16	407	74	18	68	10	1.7	0		0		0	
		2007	78	498	488	63	287	53	38	39	8	1.64	0		0		0	
		2008	60	504	502	281	149	38	18	8	6	1.2	0		2	0.4	0	
	2119	2003	26	790	790	213	396	11	82	28	0		60	7.59	0		0	
		2004	26	797	795	114	495	24	110	29	0		23	2.89	0		0	
		2005	40	699	693	66	370	19	98	74	0		63	9.09	0		3	0.43
		2006	39	595	593	15	286	15	50	164	0		62	10.4	0		1	0.17
		2007	33	501	500	7	310	9	21	137	0		17	3.4	0		0	
		2008	62	495	491	195	208	7	45	12	0		24	4.89	0		0	
	2120	2003	25	796	794	303	387	4	57	39	0		2	0.25	0		2	0.25
		2004	28	800	798	200	476	7	73	11	0		26	3.26	0		5	0.63
		2005	39	692	691	195	312	2	84	88	1	0.14	4	0.58	0		5	0.72
		2006	38	589	588	39	333	6	14	194	0		1	0.17	0		2	0.34
		2007	32	495	490	2	310	3	21	155	0		0		0		0	
		2008	63	490	487	369	86	4	18	7	0		1	0.21	0		2	0.41
	2121	2003	31	791	791	70	572	22	20	78	25	3.16	4	0.51	0		0	
		2004	18	799	795	22	490	72	116	68	16	2.01	11	1.38	0		0	
		2005	6	701	696	2	495	30	10	160	4	0.57	0		0		0	
		2006	24	595	591	42	290	54	15	142	44	7.45	4	0.68	0		0	
		2007	1	488	482	0	313	1	8	154	7	1.45	1	0.21	0		0	
		2008	55	493	492	71	260	15	43	72	29	5.89	2	0.41	0		0	
	2122	2003	30	797	796	58	628	68	15	9	18	2.26	0		0		0	
		2004	24	794	787	3	645	91	9	31	8	1.02	0		0		0	
		2005	5	699	697	9	489	64	8	126	1	0.14	0		0		0	
		2006	28	593	592	25	352	115	15	78	5	0.84	0		5	0.84	0	
		2007	36	495	494	13	330	73	25	50	3	0.61	0		0		0	
		2008	56	493	491	76	294	68	10	1	36	7.33	0		6	1.22	0	
	2123	2003	29	793	793	245	466	40	7	25	10	1.26	0		0		0	
		2004	23	790	790	58	521	57	12	36	106	13.4	0		0		0	
		2005	42	702	696	332	196	57	14	72	25	3.59	0		0		0	
		2006	29	589	589	33	333	56	10	137	22	3.74	0		0		0	
		2007	35	499	480	27	313	21	16	57	46	9.58	0		0		0	
		2008	59	493	491	269	165	21	9	9	17	3.46	0		1	0.2	0	
	2124	2003	27	797	796	433	238	5	83	20	1	0.13	16	2.01	0		0	

Area (5C/D)	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
	2124	2004	27	800	798	61	480	26	113	63	0		55	6.89	0		0	
		2005	41	700	696	410	147	19	56	40	0		24	3.45	0		0	
		2006	40	590	584	71	280	10	53	107	1	0.17	62	10.6	0		0	
		2007	34	497	492	8	295	3	36	131	0		19	3.86	0		0	
		2008	67	496	492	344	71	20	22	12	1	0.2	22	4.47	0		0	
	2125	2003	34	792	792	152	502	73	5	11	49	6.19	0		0		0	
		2004	19	798	798	69	623	80	4	2	19	2.38	0		1	0.13	0	
		2005	4	697	697	58	455	68	6	50	58	8.32	0		2	0.29	0	
		2006	42	587	584	69	378	108	5	4	18	3.08	0		2	0.34	0	
		2007	37	491	489	0	353	64	8	58	8	1.64	0		0		0	
		2008	22	489	482	148	255	38	4	9	27	5.6	0		1	0.21	0	
	2126	2003	28	797	797	331	398	37	4	13	14	1.76	0		0		0	
		2004	22	801	801	37	563	77	28	45	53	6.62	0		0		0	
		2005	43	701	701	270	215	60	14	125	17	2.43	0		0		0	
		2006	41	593	590	151	269	68	13	45	44	7.46	0		0		0	
		2007	38	496	493	2	355	14	15	98	9	1.83	0		0		0	
		2008	21	496	494	295	132	25	5	26	11	2.23	0		0		0	
	2127	2003	36	785	785	81	559	33	20	36	43	5.48	11	1.4	0		2	0.25
		2004	21	804	803	38	662	62	7	26	8	1	0		0		0	
		2005	3	700	694	90	407	94	13	34	57	8.21	0		0		0	
		2006	23	594	587	6	339	78	29	121	18	3.07	0		0		0	
		2007	20	494	479	2	328	27	24	70	29	6.05	0		0		0	
		2008	24	499	497	40	330	63	30	10	23	4.63	1	0.2	0		0	
	2128	2003	35	798	798	74	528	40	28	71	53	6.64	6	0.75	0		0	
		2004	20	796	794	15	619	33	21	72	33	4.16	1	0.13	0		0	
		2005	2	691	690	21	460	46	17	135	11	1.59	1	0.14	0		0	
		2006	22	592	536	4	342	11	11	151	17	3.17	0		0		0	
		2007	19	493	492	0	325	2	1	156	8	1.63	0		0		0	
		2008	23	497	490	61	330	26	24	10	38	7.76	1	0.2	0		0	
	2129	2003	14	787	785	102	471	27	140	8	0		24	3.06	0		13	1.66
		2004	2	799	585	83	298	13	105	83	0		3	0.51	0		0	
		2005	34	697	692	100	391	20	95	72	0		5	0.72	0		10	1.45
		2006	10	597	590	99	386	12	69	12	0		6	1.02	0		6	1.02
		2007	30	497	481	13	314	2	26	108	0		12	2.49	0		8	1.66
		2008	64	488	487	166	248	8	46	11	0		4	0.82	0		5	1.03
	2130	2003	13	787	783	75	429	18	47	202	0		5	0.64	0		7	0.89
		2004	1	804	801	32	340	4	7	413	0		3	0.37	0		2	0.25
		2005	35	698	696	63	368	24	34	192	0		8	1.15	0		7	1.01
		2006	11	596	592	150	301	23	16	88	1	0.17	9	1.52	0		4	0.68
		2007	31	488	483	2	251	5	6	212	0		5	1.04	0		2	0.41
		2008	65	498	494	175	198	21	20	76	0		3	0.61	0		1	0.2
	2131	2003	24	791	789	30	626	27	100	6	0		0		0		0	
		2004	4	800	796	46	260	10	56	424	0		0		0		0	
		2005	32	693	692	42	447	18	55	132	0		0		0		0	
		2006	12	595	589	143	320	19	82	25	0		1	0.17	0		0	
		2007	29	494	489	0	309	2	50	127	0		0		0		0	
		2008	68	492	488	126	266	20	54	22	0		0		0		0	
	2132	2003	15	792	791	14	605	6	41	124	0		1	0.13	0		0	
		2004	3	796	796	177	362	16	77	163	0		1	0.13	0		0	
		2005	33	694	693	116	365	14	62	133	0		0		0		2	0.29
		2006	9	598	595	121	367	9	63	14	0		0		0		1	0.17
		2007	28	496	488	46	300	8	23	114	0		0		0		0	
		2008	66	504	503	100	315	3	64	20	0		0		0		1	0.2
	2133	2003	22	790	789	374	300	25	56	14	0		20	2.53	0		0	
		2004	6	789	788	173	278	3	36	291	0		7	0.89	0		0	
		2005	30	693	690	52	414	17	55	150	0		2	0.29	0		0	
		2006	14	583	583	71	385	9	14	95	0		9	1.54	0		0	
		2007	26	491	491	0	351	1	9	130	0		0		0		0	
		2008	70	485	482	295	124	9	34	17	0		3	0.62	0		0	
	2134	2003	23	790	789	1	537	5	15	231	0		0		0		0	
		2004	5	796	795	98	274	17	34	372	0		0		0		0	
		2005	31	699	698	21	403	25	43	206	0		0		0		0	
		2006	13	599	593	53	339	38	31	132	0		0		0		0	
		2007	27	496	492	5	257	13	12	205	0		0		0		0	
		2008	69	499	499	150	176	62	15	97	0		0		0		0	
	2135	2003	20	788	785	20	634	42	15	8	66	8.41	0		0		0	
		2004	41	795	794	51	527	66	18	35	77	9.7	0		0		0	

Area (5C/D)	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
	2135	2005	28	696	695	30	496	101	4	10	55	7.91	0		0		0	
		2006	17	598	591	20	472	41	5	20	33	5.58	0		0		0	
		2007	84	496	491	56	349	24	5	14	42	8.55	0		1	0.2	0	
		2008	72	488	486	93	324	28	2	6	33	6.79	0		0		0	
	2136	2003	21	795	795	188	478	44	48	37	0		0		0		0	
		2004	40	799	798	40	449	32	27	250	0		0		0		0	
		2005	29	699	699	0	496	29	17	161	0		0		0		0	
		2006	18	595	594	9	464	19	49	52	0		0		0		0	
		2007	25	481	481	0	323	1	5	152	0		0		0		0	
		2008	71	489	484	261	148	13	32	30	0		0		0		0	
	2137	2003	19	786	781	37	576	26	32	88	16	2.05	6	0.77	0		0	
		2004	42	784	781	42	522	19	51	114	9	1.15	24	3.07	0		0	
		2005	27	700	695	64	422	42	48	80	23	3.31	16	2.3	0		0	
		2006	16	601	592	15	443	33	15	56	24	4.05	5	0.84	0		1	0.17
		2007	85	491	484	59	330	16	15	38	19	3.93	7	1.45	0		0	
		2008	73	495	484	129	250	9	27	32	36	7.44	3	0.62	0		0	
	2138	2003	63	798	798	145	550	30	0	56	16	2.01	1	0.13	0		0	
		2004	39	795	793	41	487	40	11	198	15	1.89	1	0.13	0		0	
		2005	24	695	695	103	455	67	7	19	42	6.04	2	0.29	0		0	
		2006	21	600	594	18	447	35	13	67	17	2.86	2	0.34	0		0	
		2007	68	492	489	6	367	18	12	79	8	1.64	0		0		0	
		2008	83	493	490	343	83	14	6	25	19	3.88	0		0		0	
	2139	2003	62	793	793	6	552	39	26	170	0		0		0		0	
		2004	38	793	791	2	547	3	25	214	0		0		0		0	
		2005	36	699	698	36	441	57	31	132	0		2	0.29	0		0	
		2006	20	597	594	8	469	25	14	78	0		0		0		0	
		2007	67	492	491	1	357	7	9	117	0		0		0		0	
		2008	81	491	491	168	203	33	15	71	0		1	0.2	0		0	
	2140	2003	65	793	793	5	634	21	78	50	0		1	0.13	0		4	0.5
		2004	43	790	789	84	487	34	163	9	0		5	0.63	0		7	0.89
		2005	26	694	690	62	457	55	70	44	0		0		0		3	0.43
		2006	15	596	583	64	384	47	56	21	0		4	0.69	0		7	1.2
		2007	86	488	487	34	348	19	62	23	0		1	0.21	0		0	
		2008	74	495	490	19	344	13	95	14	0		4	0.82	0		1	0.2
	2141	2003	64	792	792	19	586	52	102	12	0		10	1.26	0		11	1.39
		2004	44	790	787	101	421	65	137	2	0		39	4.96	0		22	2.8
		2005	25	695	694	199	343	37	34	52	0		18	2.59	0		11	1.59
		2006	22	593	584	65	390	37	34	8	0		31	5.31	0		20	3.42
		2007	65	475	465	86	265	17	43	3	0		36	7.74	0		15	3.23
		2008	84	492	491	61	253	60	78	8	0		21	4.28	0		10	2.04
	2142	2003	61	787	786	62	554	33	18	110	8	1.02	1	0.13	0		0	
		2004	37	799	795	258	321	54	32	128	2	0.25	0		0		0	
		2005	37	697	696	64	408	37	46	136	5	0.72	0		0		0	
		2006	19	598	594	31	424	19	43	59	18	3.03	0		0		0	
		2007	66	491	490	58	313	31	19	65	2	0.41	1	0.2	0		1	0.2
		2008	82	492	490	289	120	11	35	34	0		1	0.2	0		0	
	2145	2003	60	793	793	147	497	34	40	75	0		0		0		0	
		2004	36	793	790	182	417	76	67	48	0		0		0		0	
		2005	38	693	691	24	432	46	45	145	0		0		0		0	
		2006	7	598	597	41	379	64	22	95	0		0		0		0	
		2007	24	488	488	52	314	31	17	75	0		0		0		0	
		2008	80	490	488	146	245	33	49	15	0		0		0		0	
	2147	2003	59	789	770	25	623	28	54	40	0		0		0		0	
		2004	34	790	788	120	464	114	70	19	0		0		0		1	0.13
		2005	39	694	694	72	487	38	34	63	0		0		0		0	
		2006	8	598	597	18	344	76	25	135	0		0		0		0	
		2007	23	487	483	28	363	25	26	38	0		0		0		0	
		2008	85	489	488	150	260	33	30	15	0		0		0		0	
	2148	2003	58	794	792	72	538	54	63	65	0		0		0		0	
		2004	35	802	800	226	320	109	69	76	0		0		0		0	
		2005	40	694	693	95	392	45	43	118	0		0		0		0	
		2006	6	597	597	40	404	39	44	70	0		0		0		0	
		2007	21	503	501	47	311	52	63	27	0		0		0		0	
		2008	79	495	493	53	275	16	61	88	0		0		0		0	
	2150	2003	57	790	788	32	570	121	34	29	2	0.25	0		0		0	
		2004	33	794	788	154	329	151	130	24	0		0		0		0	
		2005	41	698	694	41	428	70	67	89	0		0		0		0	

Area (5C/D)	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
	2150	2006	5	598	596	42	299	127	98	35	0		0		0		0	
		2007	22	490	489	31	320	69	58	12	0		0		0		0	
		2008	86	499	496	48	269	53	112	16	0		0		0		0	
	2152	2003	56	780	780	18	601	84	27	48	0		1	0.13	0		1	0.13
		2004	7	802	798	102	496	53	31	114	0		0		0		2	0.25
		2005	44	693	693	99	470	67	20	43	0		0		0		0	
		2006	23	594	588	94	375	50	10	57	0		3	0.51	0		1	0.17
		2007	39	498	497	114	286	31	33	28	0		0		0		6	1.21
		2008	46	491	490	135	273	33	14	34	0		0		0		1	0.2
	2153	2003	51	796	795	2	608	55	121	9	0		0		0		0	
		2004	32	782	781	65	465	80	138	33	0		0		0		0	
		2005	16	696	694	4	606	9	56	21	0		0		0		0	
		2006	41	591	581	2	452	34	27	75	0		0		0		0	
		2007	57	498	493	2	400	10	11	74	0		0		0		0	
		2008	40	492	489	1	353	14	111	12	0		0		0		0	
	2154	2003	50	794	793	3	641	6	103	40	0		0		0		0	
		2004	31	800	791	3	566	67	90	65	0		0		0		0	
		2005	15	695	693	0	561	24	50	62	0		0		0		0	
		2006	34	590	578	3	439	16	5	117	0		0		0		0	
		2007	42	501	498	0	390	22	42	50	0		0		0		0	
		2008	31	492	488	5	354	32	45	55	0		0		0		0	
	2155	2003	49	793	792	3	637	47	87	18	0		0		0		0	
		2004	19	795	792	7	588	67	49	81	0		0		0		0	
		2005	12	696	693	28	497	93	60	18	0		0		0		0	
		2006	33	597	596	25	352	112	54	45	0		8	1.34	0		4	0.67
		2007	45	498	496	5	338	83	48	30	0		0		0		0	
		2008	32	501	500	10	332	81	62	17	0		0		0		0	
	2158	2003	55	778	777	54	555	91	31	32	0		7	0.9	0		7	0.9
		2004	8	792	789	103	517	71	64	4	0		5	0.63	0		9	1.14
		2005	43	695	693	151	384	60	43	45	0		5	0.72	0		5	0.72
		2006	24	599	596	195	283	71	27	17	0		2	0.34	0		1	0.17
		2007	40	493	491	80	335	30	27	12	0		1	0.2	0		7	1.43
		2008	45	496	496	176	232	37	23	21	0		3	0.6	0		4	0.81
	2159	2003	71	794	794	29	549	92	124	0	0		0		0		0	
		2004	12	798	795	33	397	144	208	13	0		0		0		0	
		2005	23	694	690	24	470	68	119	15	0		0		0		0	
		2006	4	597	595	35	391	107	56	8	0		0		0		0	
		2007	64	491	491	46	267	31	81	16	0		0		0		0	
		2008	75	501	498	66	229	110	78	17	0		0		0		0	
	2160	2003	66	790	790	10	626	108	33	3	10	1.27	0		0		0	
		2004	13	800	799	13	646	80	16	41	3	0.38	0		0		0	
		2005	20	698	696	1	533	141	5	4	13	1.87	0		0		0	
		2006	1	601	601	7	474	84	10	16	11	1.83	0		0		0	
		2007	63	495	492	0	388	62	6	25	12	2.44	0		0		0	
		2008	76	479	474	4	295	52	39	16	68	14.3	0		0		0	
	2161	2003	67	794	794	15	615	118	36	6	4	0.5	0		0		0	
		2004	14	793	793	16	652	38	34	53	0		0		0		0	
		2005	18	698	698	11	552	70	24	27	14	2.01	0		0		0	
		2006	43	596	593	1	435	86	25	41	5	0.84	1	0.17	0		0	
		2007	59	494	493	0	405	20	32	33	3	0.61	0		0		0	
		2008	42	496	494	7	304	91	70	16	6	1.21	0		0		0	
	2162	2003	52	794	793	2	636	128	14	3	9	1.13	0		1	0.13	0	
		2004	15	795	788	57	510	171	14	21	15	1.9	0		0		0	
		2005	17	701	695	6	516	145	7	13	6	0.86	1	0.14	4	0.58	0	
		2006	42	589	584	11	433	114	9	4	5	0.86	0		8	1.37	0	
		2007	58	494	492	1	407	55	4	19	1	0.2	0		5	1.02	0	
		2008	41	496	483	16	305	112	16	13	8	1.66	0		13	2.69	0	
	2163	2003	53	791	787	29	616	93	38	0	11	1.4	0		0		0	
		2004	30	788	784	265	323	82	83	20	9	1.15	0		2	0.26	0	
		2005	14	701	696	54	454	114	40	12	20	2.87	0		2	0.29	0	
		2006	35	591	590	39	397	96	34	10	12	2.03	0		2	0.34	0	
		2007	43	494	493	4	378	40	24	45	3	0.61	0		0		0	
		2008	30	484	477	65	222	92	59	12	16	3.35	0		11	2.31	0	
	2164	2003	48	787	780	63	491	171	18	1	15	1.92	0		21	2.69	0	
		2004	18	776	768	42	453	158	37	23	24	3.12	0		31	4.04	0	
		2005	13	701	697	38	415	145	12	1	11	1.58	0		75	10.7	0	
		2006	36	592	587	95	337	94	17	12	9	1.53	0		23	3.92	0	

Area	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
(5C/D)																		
	2164	2007	44	494	492	0	356	72	22	38	4	0.81	0		1	0.2	0	
		2008	29	496	489	37	274	106	21	3	7	1.43	0		41	8.38	0	
	2165	2003	44	795	791	12	598	164	13	0	0		0		4	0.51	0	
		2004	17	798	795	98	415	213	32	1	0		0		36	4.53	0	
		2005	11	700	693	21	454	165	18	0	1	0.14	0		35	5.05	0	
		2006	31	593	573	43	336	153	24	2	0		0		17	2.97	0	
		2007	56	497	484	2	353	95	9	5	0		0		20	4.13	0	
		2008	35	490	482	17	315	113	24	6	0		0		7	1.45	0	
	2169	2003	54	787	787	8	626	116	7	29	0		0		0		1	0.13
		2004	9	796	796	286	346	106	47	11	0		0		0		0	
		2005	42	698	696	3	504	61	19	118	0		0		0		0	
		2006	25	596	595	31	420	93	16	35	0		0		0		1	0.17
		2007	41	487	487	5	396	18	25	42	0		1	0.21	0		0	
		2008	44	493	488	124	237	67	17	41	0		1	0.2	0		1	0.2
	2170	2003	70	797	797	8	571	47	106	65	0		0		0		0	
		2004	10	793	792	99	508	60	83	42	0		0		0		0	
		2005	22	698	696	54	420	100	104	17	2	0.29	0		0		0	
		2006	3	599	595	28	419	78	43	26	1	0.17	0		0		0	
		2007	62	501	495	25	322	58	74	16	0		0		0		0	
		2008	78	501	498	36	276	45	115	23	3	0.6	0		0		0	
	2171	2003	69	797	797	139	479	77	54	6	3	0.38	36	4.52	0		3	0.38
		2004	11	792	789	151	396	73	99	58	1	0.13	10	1.27	0		1	0.13
		2005	21	697	696	99	382	112	30	31	15	2.16	28	4.02	0		0	
		2006	2	599	596	28	396	75	60	20	1	0.17	14	2.35	0		2	0.34
		2007	61	495	490	38	336	24	32	53	4	0.82	3	0.61	0		0	
		2008	77	491	488	87	226	50	103	11	3	0.61	9	1.84	0		1	0.2
	2172	2003	68	793	793	8	662	99	11	4	0		0		0		0	
		2004	16	793	790	28	594	144	17	7	0		0		0		0	
		2005	19	703	700	1	562	132	7	1	0		0		0		0	
		2006	44	592	587	0	463	114	11	1	0		0		0		0	
		2007	60	503	501	1	419	76	4	1	0		0		0		0	
		2008	43	483	479	4	405	56	13	1	0		0		0		0	
5E																		
	2143	2003	39	790	788	56	525	40	131	23	0		13	1.65	0		0	
		2004	26	798	794	48	487	46	126	72	0		13	1.64	0		2	0.25
		2005	1	696	694	94	421	44	78	55	0		4	0.58	0		0	
		2006	26	597	592	59	305	106	68	49	0		6	1.01	0		0	
		2007	53	494	492	35	289	29	60	72	0		7	1.42	0		0	
		2008	25	492	489	58	283	49	66	27	0		6	1.23	0		0	
	2144	2003	38	796	795	204	454	71	13	15	0		0		38	4.78	0	
		2004	25	793	785	473	201	62	36	11	0		0		2	0.25	0	
		2005	2	696	692	299	234	41	56	58	0		2	0.29	2	0.29	0	
		2006	27	599	594	345	193	41	12	3	0		0		0		0	
		2007	52	494	493	134	289	29	25	14	0		0		1	0.2	0	
		2008	26	490	480	207	199	27	38	11	0		0		0		0	
	2146	2003	37	796	794	43	479	111	19	9	44	5.54	0		89	11.2	0	
		2004	27	795	791	25	412	185	20	17	30	3.79	0		102	12.9	0	
		2005	3	692	687	25	375	98	15	7	36	5.24	0		131	19.0	0	
		2006	28	593	589	5	369	75	22	6	16	2.72	0		97	16.4	0	
		2007	51	488	487	3	326	97	19	9	6	1.23	0		27	5.54	0	
		2008	27	496	493	17	283	122	21	1	7	1.42	0		41	8.32	0	
	2149	2003	40	795	791	83	469	24	143	38	0		34	4.3	0		0	
		2004	29	800	794	104	366	25	139	94	0		66	8.31	0		0	
		2005	4	701	688	84	405	30	103	30	0		37	5.38	0		0	
		2006	29	595	587	41	382	29	95	15	0		25	4.26	0		0	
		2007	50	487	481	0	318	21	88	35	0		19	3.95	0		0	
		2008	28	498	414	9	270	29	77	18	0		12	2.9	0		0	
	2151	2003	41	791	790	74	532	41	96	1	0		35	4.43	0		11	1.39
		2004	28	788	779	98	528	61	45	5	0		27	3.47	0		15	1.93
		2005	5	700	696	51	478	59	75	4	0		13	1.87	1	0.14	16	2.3
		2006	37	593	588	44	377	44	96	7	0		15	2.55	0		6	1.02
		2007	49	494	488	26	370	17	48	7	0		13	2.66	0		8	1.64
		2008	36	487	470	41	305	31	53	12	0		19	4.04	0		9	1.91
	2156	2003	42	795	795	111	568	31	62	4	0		10	1.26	0		9	1.13
		2004	21	799	791	148	491	44	44	14	0		20	2.53	0		30	3.79
		2005	9	692	689	62	504	37	50	8	0		11	1.6	0		17	2.47
		2006	32	593	588	58	411	48	40	13	0		6	1.02	0		13	2.21

Area (5E)	Station	Year	Set	Hkd	Hko	Nb	Ne	No	614	044	401	CPUE	442	CPUE	394	CPUE	424	CPUE
	2156	2007	54	502	496	66	324	24	33	22	0		8	1.61	0		19	3.83
		2008	33	505	503	46	310	42	62	22	0		14	2.78	0		8	1.59
	2157	2003	47	792	788	8	628	85	9	2	0		0		56	7.11	0	
		2004	24	791	778	66	510	139	32	0	0		0		31	3.98	0	
		2005	6	697	695	8	404	136	19	0	0		0		128	18.4	0	
		2006	38	595	590	1	514	49	11	0	0		0		16	2.71	0	
		2007	46	490	484	2	358	72	14	10	0		0		28	5.79	0	
		2008	37	488	483	9	333	42	32	3	0		0		65	13.4	0	
	2166	2003	43	788	788	53	531	187	16	0	0		0		1	0.13	0	
		2004	20	798	209	77	81	37	8	1	0		0		5	2.39	0	
		2005	10	698	688	34	398	185	29	0	0		0		42	6.1	0	
		2006	30	594	588	188	205	174	12	1	0		0		9	1.53	0	
		2007	55	488	485	30	305	126	8	4	0		0		12	2.47	0	
		2008	34	490	481	8	313	126	18	1	0		0		15	3.12	0	
	2167	2003	45	788	786	95	394	44	45	12	103	13.1	92	11.7	1	0.13	0	
		2004	22	795	786	100	300	56	72	28	171	21.7	59	7.51	0		0	
		2005	7	702	697	28	391	96	57	12	70	10.0	47	6.74	0		0	
		2006	39	593	575	20	352	30	70	14	71	12.3	21	3.65	0		0	
		2007	47	489	483	5	272	36	54	51	41	8.49	23	4.76	0		0	
		2008	38	495	484	31	280	34	49	7	43	8.88	40	8.26	0		0	
	2168	2003	46	791	789	114	524	25	107	18	1	0.13	0		0		0	
		2004	23	801	795	117	419	58	102	92	7	0.88	0		0		0	
		2005	8	700	698	27	501	51	92	24	4	0.57	0		0		0	
		2006	40	598	583	16	486	13	61	3	3	0.51	1	0.17	0		0	
		2007	48	499	493	10	357	20	53	50	3	0.61	0		0		0	
		2008	39	498	488	83	312	8	72	13	0		0		0		0	